ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 82

[FRL-]

[RIN 2060-AF37]

Protection of Stratospheric Ozone; Refrigerant Recycling; Substitute Refrigerants

AGENCY: Environmental Protection Agency (EPA)

ACTION: Final Rule

SUMMARY: The Environmental Protection Agency (EPA) is amending the rule on refrigerant recycling, promulgated under section 608 of the Clean Air Act (CAA or Act), to clarify how the requirements of section 608 apply to refrigerants that are used as substitutes for chlorofluorocarbon (CFC) and hydrochlorofluorocarbon (HCFC) refrigerants.

This rule explicates the self-effectuating statutory prohibition on venting substitute refrigerants to the atmosphere that became effective on November 15, 1995. The rule also exempts certain substitute refrigerants from the venting prohibition on the basis of current evidence that their release does not pose a threat to the environment.

In addition, EPA is amending the current refrigerant recovery and recycling requirements for chlorofluorocarbon (CFC) and hydrochlorofluorocarbon (HCFC) refrigerants to accommodate the proliferation of new refrigerants on the market, and to clarify that the venting prohibition applies to all refrigerants for which EPA has not made a determination that their release "does not pose a threat to the environment," namely hydrofluorocarbon (HFC) and perfluorocarbon (PFC) refrigerants. With the exception of

the venting prohibition, this rule will not further regulate the use or sale of substitute refrigerants that do not contribute to the depletion of the stratospheric ozone layer, such as HFC and perfluorocarbon PFC refrigerants. In addition, today's action will not address leak repair requirements for appliances containing substitutes for ozone-depleting substance (ODS) refrigerants nor will it address certification requirements for refrigerant recovery or recycling equipment intended for use with substitute refrigerants.

EFFECTIVE DATE: [INSERT DATE 60 DAYS FROM DATE OF PUBLICATION IN THE FEDERAL REGISTER]

ADDRESSES: Materials relevant to the rulemaking are contained in Air Docket No. A-92-01 located at U.S. Environmental Protection Agency; 1301 Constitution Ave., NW; Washington, DC, 20460. The Docket may be inspected from 8:00 a.m. to 5:30 p.m., Monday through Friday. A reasonable fee may be charged for copying docket materials.

FOR FURTHER INFORMATION CONTACT: Information concerning this rulemaking should be forwarded to Julius Banks; U.S. Environmental Protection Agency; Global Programs Division-Stratospheric Program Implementation Branch; Mail Code 6205-J; 1200 Pennsylvania Avenue, NW; Washington, DC 20460. The Stratospheric Ozone Information Hotline (800-296-1996) and the Ozone Webpage www.epa.gov/ozone can also be contacted for further information.

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I. REGULATED ENTITIES

Entities potentially regulated by this action include those that manufacture, own, maintain, service, repair, or dispose of all types of air-conditioning and refrigeration appliances, including motor vehicle air-conditioners; those that sell or reclaim refrigerants; those that certify technicians; and manufacturers and certifiers of refrigerant recycling and recovery equipment. This listing is not intended to be exhaustive, but rather provides a guide for readers regarding entities likely to be regulated by this action. To determine whether your company is regulated by this action, you should carefully examine the applicability criteria contained in section 608 of the CAA Amendments of 1990. The applicability criteria are discussed below and in regulations published on December 30, 1993 (58 FR 69638). If you have questions regarding the applicability of this action to a particular entity, consult the person listed in the preceding **FOR FURTHER INFORMATION CONTACT** section.

II. OVERVIEW

Effective November 15, 1995, section 608(c)(2) of the Act prohibits the knowing venting, release, or disposal of any substitute for CFC and HCFC refrigerants by any person maintaining, servicing, repairing, or disposing of air-conditioning and refrigeration equipment. This prohibition applies unless EPA determines that such venting, releasing, or disposing does not pose a threat to the environment.

Today's final rule clarifies how the venting prohibition of section 608(c)(2) applies to substitute refrigerants for which EPA is not determining that their release does not pose a threat to the environment, namely, HFC and PFC refrigerants. In addition to

establishing that the venting prohibition will remain in effect for HFC and PFC substitute refrigerants, this rule will clarify that EPA regulations affecting the handling and sales of ozone-depleting refrigerants are applicable to substitute refrigerants, primarily HFC refrigerant blends, that contain an ozone-depleting substance (ODS). Today's rule does not extend the refrigerant sales restriction to pure HFC and PFC refrigerants. This rule does exempt from the venting prohibition certain refrigerant substitutes for which EPA has determined that their release does not pose a threat to the environment.

A. Section 608 of the Clean Air Act

Section 608 of the CAA requires EPA to establish a comprehensive program to limit emissions of ozone-depleting refrigerants. Section 608 also prohibits the release or disposal of ozone-depleting refrigerants and their substitutes during the maintenance, service, repair, or disposal of air-conditioning and refrigeration appliances.

Section 608 is divided into three subsections. In brief, section 608(a) requires EPA to develop regulations and standards to reduce the use and emission of class I substances (e.g., CFCs, halons, carbon tetrachloride, and methyl chloroform) and class II substances (e.g., HCFCs) to the lowest achievable level, and to maximize the recapture and recycling of such substances. Section 608(b) requires that the regulations promulgated pursuant to subsection (a) contain standards and requirements concerning the safe disposal of class I and class II substances. Finally, section 608(c) establishes a self-effectuating prohibition on the venting into the environment of class I or class II substances and their substitutes during servicing and disposal of air-conditioning or refrigeration equipment.

Section 608(a) provides EPA authority to promulgate many of the requirements

in today's rule. Section 608(a) requires EPA to promulgate regulations regarding use and disposal of class I and II substances that "reduce the use and emission of such substances to the lowest achievable level" and "maximize the recapture and recycling of such substances." Section 608(a) further provides that "such regulations may include requirements to use alternative substances (including substances which are not class I or class II substances) . . . or to promote the use of safe alternatives pursuant to section 612 or any combination of the foregoing." EPA's authority to promulgate regulations regarding use of class I and II substances (including requirements to use alternatives) is sufficiently broad to include requirements on how to use alternatives, where regulations are required to reduce emissions and maximize recycling of class I and II ODSs.

Section 608(c) provides EPA authority to promulgate regulations to interpret, implement and enforce the venting prohibition. Subsection 608(c) provides in paragraph (1) that, effective July 1, 1992, it is *"unlawful for any person, in the course of maintaining, servicing, repairing, or disposing of an appliance or industrial process refrigeration, to knowingly vent or otherwise knowingly release or dispose of any class I or class II substance used as a refrigerant in such appliance (or industrial process refrigeration) in a manner which permits such substance to enter the environment.*" The statute exempts from this self-effectuating prohibition "[d]e minimis releases associated with good faith attempts to recapture and recycle or safely dispose" of a substance. EPA considers releases to meet the criteria for exempted de minimis releases when they occur while the recycling and recovery requirements of the section 608 and 609 regulations are followed (§ 82.154(a)).

Section 608(c)(2) extends the prohibition on venting to substances that are

substitutes for class I and class II refrigerants, effective November 15, 1995, unless the Administrator determines that such venting or release "does not pose a threat to the environment." While section 608(c) is self-effectuating, EPA regulations are necessary to define "[d]e minimis releases associated with good faith attempts to recapture and recycle or safely dispose" of such substances, and to effectively implement and enforce the venting prohibition.

EPA is today promulgating regulations to implement and clarify the requirements of section 608(c)(2), which extends the prohibition on venting to substitutes for CFC and HCFC refrigerants. These regulations are also vital to the Agency's efforts to continue to carry out its mandate under section 608(a) to minimize emissions of ozone-depleting substances.

B. Factors Considered in the Development of this Rule

In developing this rulemaking, EPA has considered a number of factors in determining whether the release of a substitute refrigerant poses a threat to the environment. First, EPA has considered which refrigerants should be classified as "substitute" refrigerants. EPA is adopting a definition of substitute that is similar to that adopted by EPA in its Significant New Alternatives Policy (SNAP) Program, except the definition omits the proviso of the SNAP definition that a substitute be "intended for use as a replacement for a class I or class II ozone-depleting substance."

As the second factor in this rulemaking, EPA has made a determination regarding whether or not the release of a substitute refrigerant during the maintenance, service, repair or disposal of an appliance poses a threat to the environment. This determination consists of two findings. First, EPA determined whether the release of a

substitute refrigerant could pose a threat to the environment due to the toxicity or other inherent characteristic of the refrigerant. Second, EPA determined whether and to what extent such releases or disposal actually takes place during the servicing and disposal of appliances, and to what extent these releases are controlled by other authorities or regulations. The release of many substitute refrigerants is limited and/or controlled by other entities, such as Occupational Safety and Health Administration (OSHA) regulations or EPA regulations under other authorities. To the extent that releases during the maintenance, service, repair, or disposal of appliances are adequately controlled by other authorities, EPA defers to these authorities rather than set up a second duplicative regulatory regime.

As the third factor in this rulemaking, EPA has considered the availability of technology to control releases, the environmental benefits of controlling releases, and the costs of controlling releases for each class of substitutes.

EPA has identified five classes of substitute refrigerants in the sectors covered under SNAP: HFCs, PFCs, hydrocarbons, chemically active common gases (including ammonia and chlorine), and inert atmospheric constituents (including carbon dioxide (CO_2) and water). EPA has divided substitutes into these classes on the basis of the varying environmental impacts of each class and the varying regulatory structures already in place for each class.

C. Public Participation

In developing this rule, EPA has considered comments received in response to the Notice of Proposed Rulemaking (NPRM) as well as those comments stated during meetings with industry, government, and environmental representatives. During

meetings with industry and government representatives, EPA has gained a better understanding of current industry practices and how existing regulatory authorities serve to control emissions of substitute refrigerants. All data and information received from industry and government representatives that EPA has relied on in developing this final rule was placed in the docket and made available to the public. EPA refers readers to Docket No. A-92-01, Categories VI-B8, VIII-H, VIII-H1, and VIII-H6 for all factual materials. In addition, EPA has consulted the air-conditioning and refrigeration industry's primary standards-setting organizations, the Air-Conditioning and Refrigeration Institute (ARI) and the American Society of Heating, Refrigeration, and Air-Conditioning Engineers, Inc. (ASHRAE), in developing this rule. As required by statute, EPA has, where appropriate, incorporated in this rule voluntary consensus standards and guidelines developed by these organizations.

D. Notice of Proposed Rulemaking (NPRM) Regarding Recycling of Substitute Refrigerants

On June 11, 1998, EPA published an NPRM (63 FR 32044) outlining requirements for substitute refrigerants. In that notice, EPA proposed regulations under Section 608 of the Act to amend 40 CFR Part 82 by proposing regulations nearly identical to those dealing with the use and handling of class I and class II ODS refrigerants. In the NPRM, EPA proposed to extend the regulatory framework for CFC and HCFC refrigerants to HFC and PFC refrigerants, making appropriate adjustments for the varying physical properties and environmental impacts of these refrigerants. The following requirements were included in the NPRM:

· Appliances containing HFC or PFC refrigerants would have to be evacuated to

established levels;

- Refrigerant recycling and recovery equipment used with HFCs or PFCs would have to be certified;
- Technicians servicing, maintaining, or repairing appliances containing HFC or PFC refrigerants would have to be certified;
- Sales of HFC and PFC refrigerants would be restricted to certified technicians;
- Used HFC and PFC refrigerants sold to a new owner would have to be reclaimed by an EPA-certified refrigerant reclaimer and tested to verify that they meet industry refrigerant standards, including purity standards;
- Refrigerant reclaimers who reclaim HFC or PFC refrigerants would have to be certified;
- Owners of HFC and PFC appliances with refrigerant charges greater than 50 lbs. would have to repair leaks when the applicable leak repair trigger rate was exceeded over a 12-month period;
- Final disposers of small appliances and motor vehicle air conditioners (MVACs) containing HFCs or PFCs would have to ensure that refrigerant was recovered from this equipment before it was disposed of; and
- Manufacturers of HFC and PFC appliances would have to provide a servicing aperture or a “process stub” on their equipment in order to facilitate recovery of the refrigerant.

The NPRM also proposed clarifications to the requirements of section 608 as they would apply to substitutes for CFC and HCFC refrigerants, and proposed to exempt certain substitute refrigerants from the statutory venting prohibition on the basis

of evidence that their releases do not pose a threat to the environment. In addition, EPA proposed to amend the requirements for CFC and HCFC refrigerants to accommodate the proliferation of new refrigerants on the market and to strengthen and clarify the leak repair requirements.

The NPRM asked for public comment on the Agency's proposed findings and on the rationale behind them. The Agency received 167 public comment letters (comments/commenters) in response to the NPRM. In general, most commenters recognized the need for mandatory refrigerant recovery in order to help protect the ozone layer and to provide a source of refrigerant to service existing capital equipment after the phaseout of CFC and HCFC refrigerant production is complete. The majority of commenters believed that the proposed amendments were necessary to clarify and improve regulations, but many expressed concerns over the regulation of refrigerants that do not deplete the ozone layer. EPA received mixed comments concerning the proposed HFC refrigerant sales restriction. Representatives of the MVAC service sector were in favor of the restriction, while representatives of the after market automotive parts sector opposed any refrigerant sales restriction.

Today's action addresses the public comments received in response to the proposed rule as they relate to the components of the NPRM that EPA is finalizing in today's action. Comments concerning leak repair requirements and certification of refrigerant recovery/recycling equipment will be addressed in separate rulemakings. Relevant comments that are not directly addressed in today's action are addressed in the accompanying "Response to Comments" document, which is available in Air Docket No. A-92-01.

III. SCOPE OF STATUTORY AND REGULATORY REQUIREMENTS

A. EPA's Statutory Authority

Pursuant to Section 608(a) of the Clean Air Act, EPA is broadly authorized to promulgate regulations establishing standards and requirements regarding the use and disposal of class I and class II substances during service, repair, or disposal of appliances and industrial process refrigeration (42 U.S.C. 7671g(a)). Section 608(b) authorizes EPA to promulgate regulations establishing standards and requirements assuring the safe disposal of class I and class II substances (42 U.S.C. 7671g(b)). Section 608(c)(1) provides that it is unlawful for any person, while in the course of maintaining, servicing, repairing, or disposing of an appliance or of industrial process refrigeration, to knowingly vent, release, or dispose of any class I or class II substance used as a refrigerant in a manner that permits such substance to enter the environment (42 U.S.C. 7671g(c)(1)). Section 608(c)(2) provides that the Section 608(c)(1) knowing venting, release, or disposal prohibition also applies to the venting, release, or disposal of any substitute substance for a class I or class II substance by any person maintaining, servicing, repairing, or disposing of any appliance or industrial process refrigeration that contains and uses such substitute substance as a refrigerant – unless EPA determines that venting, releasing, or disposing of such substitute substance does not pose a threat to the environment (42 U.S.C. 7671g(c)(2)).

With today's action, EPA is amending the current refrigerant recovery and recycling requirements for chlorofluorocarbon (CFC) and hydrochlorofluorocarbon (HCFC) refrigerants to accommodate the proliferation of new refrigerants on the market,

and to clarify that the Section 608(c) venting prohibition applies to all refrigerants consisting in whole or in part of a class I or class II ozone-depleting substance (ODS). This rule also explicates the self-effectuating statutory prohibition on venting substitute refrigerants to the atmosphere that became effective on November 15, 1995. In addition, the rule exempts certain substitute refrigerants from the venting prohibition on the basis of current evidence that their release does not pose a threat to the environment.

Public comments questioned the need for regulations for a self-effectuating venting prohibition. Section 608(c)(2) establishes a self-effectuating prohibition on venting of any refrigerants that are substitutes for CFCs and HCFCs. Thus, venting of all substitute refrigerants, including HFC and PFC refrigerants (and blends thereof) is prohibited under section 608(c), with the exception of de minimis releases associated with good faith attempts to recapture and recycle. The de minimis releases exception, however, is not self-effectuating, nor is it self-explanatory.

EPA believes that regulatory clarification is necessary to define such "[d]e minimis releases" and "good faith attempts to recapture and recycle or safely dispose of any such substance" and safely dispose of appliances to effectively implement and enforce the venting prohibition. Section 608(c)(1) in conjunction with 608(c)(2) of the Act allow for an exemption for de minimis releases associated with good faith attempts to recapture and recycle or safely dispose of substitutes for class I and class II ODSs used as refrigerants. A regulation reflecting the statutory requirement for recovery of substitute refrigerants is an essential part of a regulatory framework within which de minimis releases and good faith attempts to recapture and recycle or safely dispose of

substitute refrigerants can be defined.

B. Determination of Whether Release Poses a Threat to the Environment

Section 608(c)(2) extends the prohibition on venting to substances that are substitutes for class I and class II refrigerants, effective November 15, 1995, unless the Administrator determines that such venting or release does not pose a threat to the environment. In determining whether the release of a substitute refrigerant during the maintenance, servicing, repair, or disposal of appliances poses a threat to the environment, EPA has examined the potential effects of the refrigerant from the moment of release to its breakdown in the environment, considering possible impacts on workers, building occupants, and the environment. These effects vary among the different classes of refrigerants.

EPA has also examined the extent to which the release of a substitute refrigerant is already controlled by other authorities (such as state and local regulations, building codes, and other Federal regulations). In some cases, such authorities tightly limit the quantity of the substitute emitted or disposed; in others, they ensure that the substitute is disposed of in a way that will limit its impact on human health and the environment. In other cases, existing authorities address some threats (e.g., occupational exposures), but not others (e.g., long-term environmental impacts).

The discussion that follows details the potential environmental impacts of and existing controls on each class of refrigerant addressed in today's action.

1. HFC and PFC Refrigerants

In the NPRM, EPA proposed not to find that the release of HFC and PFC refrigerants does not pose a threat to the environment. HFC and PFC refrigerants have

been classified as A1 refrigerants under American Society of Heating Refrigeration and Air-conditioning Engineers (ASHRAE) Standard 34[1], indicating that they have low toxicity and no ability to propagate flame under the test conditions of the Standard. The exception is HFC-152a, which has been classified as an A2 refrigerant. This indicates that HFC 152a may propagate flame under the test conditions, but only at relatively high concentrations and with relatively low heat of combustion. However, like CFC and HCFC refrigerants, HFCs can have central nervous system depressant and cardio-toxic effects at high concentrations, (several thousand parts-per-million (ppm)), and can displace oxygen at very high concentrations.

[1]ASHRAE 34, "Number Designation and Safety Classification of Refrigerants," establishes a uniform system of assigning the proper reference number classification to refrigerants, and includes safety classifications based on toxicity and flammability data.

Moreover, once released into the atmosphere, HFCs and PFCs have the ability to trap heat that would otherwise be radiated from the Earth back to space. This ability, along with the relatively long atmospheric lifetime of these gases (particularly the PFCs), gives both HFCs and PFCs relatively high global warming potentials (GWPs). The 100-year GWPs of HFCs under consideration for use as refrigerants range from 140 (for HFC-152a) to 11,700 (for HFC-23), and the GWPs of PFCs under consideration for use as refrigerants range from 8,700 (for perfluorocyclobutane) to 9,200 (for perfluoroethane). HFC-134a, the most common individual HFC used in air-conditioning and refrigeration equipment, has a GWP of 1,300. Thus, the global warming impact of releasing a kilogram of an HFC or PFC ranges from 140 to 11,700 times the impact of releasing a kilogram of CO_2[2] (factoring in the 35% uncertainty associated with individual GWPs, this range becomes 90 to 15,800.) Therefore, EPA is not determining that HFC and PFC substitute refrigerants do not pose a threat to the environment.

Under SNAP, HFC refrigerants (either pure or in blends) have been approved for use in almost every major air-conditioning and refrigeration end-use, including household refrigerators, motor vehicle air conditioners, retail food refrigeration, comfort cooling chillers, industrial process refrigeration, and refrigerated transport. HFC-134a in

[2]The CFCs and HCFCs being replaced by the HFCs are also greenhouse gases, though their direct warming effect is counteracted somewhat by the indirect cooling effect caused by their destruction of stratospheric ozone, which is itself a greenhouse gas.

particular has claimed a large share of the market for non-ozone-depleting substitutes in these applications. Given this range of applications, HFCs have the potential to come into contact with consumers, workers, the general population, and the environment.

Under SNAP, EPA has approved PFCs for use in relatively few end-uses because of their large GWPs and long atmospheric lifetimes. These end-uses include uranium isotope separation, for which no other substitute refrigerant has been found, and some heat-transfer applications. In these applications, PFCs may come into contact with workers, the general population, and the environment.

Analyses performed for both this rule and the SNAP rule (59 FR 13049) indicate that existing regulatory requirements and industry practices are likely to keep the exposure of consumers, workers, and the general population to HFCs and PFCs below levels of concern (although recycling requirements would reduce still further the probability of significant exposure).[3] However, these requirements and practices do not address releases of HFCs or PFCs to the wider environment. For example, ASHRAE Standard 15[4] requirements, for equipment with large charge sizes, are likely to limit the

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[3]U.S. EPA. 1994. Risk Screen on the Use of Substitutes for Class I Ozone-Depleting Substances: Refrigeration and Air-Conditioning. Office of Air and Radiation, March 15, 1994. Regulatory Impact Analysis for the Substitutes Recycling Rule, Office of Air and Radiation, 1998).

[4]ASHRAE 15, Safety Code for Mechanical Refrigeration, is an industry standard developed by the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE). ASHRAE 15 forms the basis for state and local building codes

exposure of building occupants and workers to HFC and PFC refrigerants, but will not necessarily reduce releases to the atmosphere. In accordance with ASHRAE 15, equipment containing large charges of HFCs or PFCs (or HCFCs or CFCs) must be located in a machinery room that meets certain requirements for tight fitting or outward-opening doors, refrigerant detectors that activate alarms when refrigerant levels rise above recommended long-term exposure levels, and mechanical ventilation that discharges released refrigerant to the outdoors. However, ASHRAE 15 does not include requirements for refrigerant recovery or recycling[5]. In general, ASHRAE 15 addresses design specifications rather than service and disposal practices, and ASHRAE 15 requirements are codified and enforced by state or local building codes rather than by contractor licensing boards or Federal agencies.

Similarly, the American Industrial Hygiene Association has developed exposure limits for HFCs. These may be referenced by OSHA under its general duty clause to compel employers to protect employees from identified health hazards. However, local exhaust ventilation rather than recycling may be used to minimize exposures during service and disposal operations that involve significant releases of refrigerant. This will reduce worker exposure to the refrigerant, but will not reduce the exposure of the general environment.

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throughout the U.S.

[5]ASHRAE Guideline 3 recommends recycling of all fluorocarbon refrigerants, but is not codified or enforced by any Federal agency.

Finally, many of the statutory and regulatory mechanisms that limit release of other substitutes do not apply to HFCs or PFCs. HFCs and PFCs are not listed chemicals for the purposes of the Superfund Amendments and Reauthorization Act (SARA) Title III or the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) reporting requirements; nor are they listed as EPA section 112(r) hazardous air pollutants.

Several commenters advised EPA to take a balanced view of HFC refrigerants' threat to the environment by including discussions on the associated benefits of their use. Commenters stated that HFCs contribute considerably less to greenhouse gas emissions than their precursors in many applications, promote energy efficiency, and in many instances are cost-effective alternatives to ozone-depleting refrigerants.

The Act prohibits the release of a substitute for a class I or class II ODS refrigerant unless EPA determines that such a release "does not pose a threat to the environment." The commenters make valid points that in some circumstances HFC refrigerants may contribute less to greenhouse gas emissions than their precursors in some applications; promote energy efficiency; and in many instances are cost-effective alternatives to ozone-depleting refrigerants. Nonetheless, for the reasons discussed above, EPA concludes that HFC and PFC refrigerants have adverse environmental effects. For this reason, and because of a lack of regulation governing the release of such substitute refrigerants, EPA is not making a determination that the release of HFC or PFC refrigerants "do not pose a threat to the environment." Hence, the statutory venting prohibition remains in effect for these refrigerants, and the knowing venting of HFC and PFC refrigerants during the maintenance, service, repair and disposal of

appliances remains illegal.

2. Chemically Active Common Gases

In the NPRM, EPA proposed to find that the release of either of the two SNAP-approved chemically active common gases used as refrigerants (i.e., ammonia and chlorine) during the service, maintenance, repair, and disposal of appliances does not pose a threat to the environment under section 608.

EPA received comments supporting the exemptions for ammonia and chlorine, as long as the exemptions are restricted to their use in industrial process applications, because it accurately asserts that the release of ammonia and chlorine refrigerants is properly safeguarded and controlled by other authorities. Commenters supported EPA's proposed determination that the release of ammonia and chlorine refrigerants used during the servicing, maintenance, repair, and disposal of appliances does not pose a threat to the environment under section 608(c)(2).

Occupational exposure to ammonia is primarily controlled by OSHA requirements and national and local building and fire codes. OSHA sets permissible exposure limits (PELs) to protect workers against the health effects of exposure to hazardous substances. PELs are regulatory limits on the amount or concentration of a substance in the air, based on an 8-hour time weighted average (TWA) exposure. PELs are enforceable by OSHA. OSHA has established a PEL for ammonia of 50 ppm. This is an enforceable standard that can be met through containment, safe disposal, ventilation, and/or use of personal protective equipment. OSHA also has requirements in place to prevent catastrophic releases, including the Hazardous Waste Operations and Emergency Response Standard (HAZWOPER), the Hazard Communication

Standard, and Process Safety Management (PSM) regulations that cover systems containing more than 10,000 pounds of ammonia. These standards require employee training, emergency response plans, and written standard operating procedures.

State and local codes, based upon ASHRAE 15, impose strict quantity limits for direct-type ammonia refrigeration systems (which possess no secondary heat transfer fluid), and generally prohibit the use of ammonia in direct-type comfort cooling systems. In accordance with the standard, indirect type ammonia refrigeration and air-conditioning systems (which possess a secondary heat transfer fluid) must be housed in a separate mechanical equipment room. This equipment room must meet the requirements listed above for HFC equipment rooms and must also meet several fireproofing requirements.

Releases of ammonia to the wider environment are addressed by several authorities. CERCLA and SARA require reporting of accidental and intentional releases of ammonia to the atmosphere. Under CERCLA section 103 and SARA Title III section 304, releases of more than 100 pounds of ammonia must be reported immediately, unless they are "Federally permitted" such as through the National Pollutant Discharge Elimination System (NPDES), State Implementation Plans (SIPs), etc. In such cases, releases are controlled under the permitting authority.

The more common release of ammonia is due to disposal. Disposal is generally performed by mixing the ammonia with water, which lowers or neutralizes the pH of the ammonia, and then disposing of the water/ammonia solution. Releases of ammonia to surface waters are governed by permits issued by states (or, in some cases, by EPA Regional Offices) to publicly owned treatment works (POTWs) under NPDES. NPDES

permits must include conditions necessary to meet applicable technology-based standards and water quality standards. Water quality standards established by states consist of a designated use for the waters in question, water quality criteria specifying the amount of various pollutants that may be present in those waters and still allow the waters to meet the designated use, and anti-degradation policies.

Entities that discharge to a POTW (usually through a municipally-owned sewer system) must themselves comply with Clean Water Act pretreatment requirements, which may include categorical pretreatment standards on an industry-by-industry basis as well as local limits designed to prevent interference with the biological processes of the treatment plant (or pass through of pollutants). Notification and approval requirements enable POTWs to manage the treatment process, avoid ammonia overloading, and protect the treatment processes, collection systems, and facility workers. The POTW typically considers a number of factors before granting discharge approval for ammonia, including the POTW plant's treatment capacity, existing industry discharge patterns, the impact on the POTW's biological treatment processes, the effect on the sewage collection systems (i.e., sewer lines), and the possible hazards to workers at the plant or in the field. The POTW also considers the possibility that ammonia disposed from refrigeration systems may largely be converted to other forms of nitrogen (e.g., nitrates) before arriving at the POTW facility.

Ammonia is also listed as a regulated substance for accidental release prevention in the List of Substances and Thresholds rule (59 FR 4478; January 31, 1994) promulgated under section 112(r) of the Clean Air Act. This rule states that if a stationary source handles more than 10,000 pounds of anhydrous ammonia (or 20,000

pounds of 20% or greater aqueous ammonia) in a process, it is subject to chemical accident prevention regulations promulgated under section 112(r). These regulations, which were published on June 20, 1996 (61 FR 31668), require stationary sources to develop and implement a risk management program that includes a hazard assessment, an accident prevention program (including training and the development of standard operating procedures), and an emergency response program. In addition, section 112(r)(1) states that companies have a general duty to prevent accidental releases of extremely hazardous substances, including ammonia and chlorine.

Chlorine has not been submitted or approved under SNAP, for use as a class I or class II ODS refrigerant substitute, except in industrial process refrigeration. In this application, chlorine could come into contact with workers, the general population, and the environment. Regulatory impact and risk screen analyses performed for both this rule and the SNAP rule indicate that regulatory requirements and industry practices are likely to keep the exposure of workers, the general population, and the environment to ammonia and chlorine below levels of concern. Exposures to chlorine are controlled through many of the same regulatory mechanisms that control exposures to ammonia, except enforceable concentration and release limits are lower for chlorine than for ammonia. For instance, the OSHA PEL for chlorine is one ppm compared to 50 ppm for ammonia. Similarly, the reporting threshold under CERCLA section 103 and SARA Title III for chlorine releases is 10 pounds compared to 100 pounds for ammonia, and the quantity of chlorine that triggers requirements under section 112(r) is 2,500 pounds per process. In addition to these requirements, chlorine is listed as a Hazardous Air Pollutant

(HAP) under section 112(b) of the Act, and under section 113 of the Act criminal penalties can be assessed for negligently releasing HAPs into the atmosphere.

In the proposal, EPA requested comment on whether there are chlorine sources that are "major sources" under CAA section 112(a). Section 112 defines "major source" as any stationary source or group of stationary sources located within a contiguous area and under common control that emits or has the potential to emit considering controls, in the aggregate, 10 tons per year or more of any hazardous air pollutant or 25 tons per year or more of any combination of HAPs. Such sources could be restricted, controlled, and/or phased-out of production. The Maximum Achievable Control Technology (MACT) standards under Section 112 of the Act, classify chlorine as a controllable HAP.

EPA received comment stating that chlorine manufacturing plants could be considered as “major sources” under section 112 of the Act, because the Act defines a major source to include all actual and potential emissions of all hazardous air pollutants from all facilities and processes at one site. The potential emissions due to chlorine’s use as a refrigerant may be small, but the potential emissions are large enough to make the site “major.”

Current industry practices and engineering controls in chlorine manufacture are applied to the use of chlorine as a refrigerant, minimizing potential releases and exposures. These practices and controls include use of system alarms that activate at chlorine concentrations of one ppm, use of self-contained breathing apparatus during servicing, isolation of liquid chlorine in receivers during servicing, and use of caustic scrubbers to neutralize gaseous chlorine during servicing. Such monitoring efforts are included in ASHRAE 15 and ASHRAE Guideline 3-“Reducing Emission of Halogenated

Refrigerants in Refrigeration in Refrigeration and Air-Conditioning Equipment and Systems," these standards are typically adopted into service standard operating procedures and local building codes. The charge sizes in the refrigeration system are several times smaller than the quantity of chlorine in the process stream and bulk storage, and chlorine emissions from the refrigeration system are likely to be significantly smaller than those emanating from the process and storage systems, which are already well controlled for safety and health reasons.

Because releases of ammonia and chlorine from their currently approved air-conditioning and refrigeration applications are adequately addressed by other authorities, EPA is making the determination that the release of ammonia and chlorine refrigerants during the service, maintenance, repair, and disposal of appliances does not pose a threat to the environment under section 608(c)(2). This determination does not endorse the venting of ammonia and chlorine refrigerants. The Agency supports responsible handling of these refrigerants during the service, maintenance, repair, and disposal of appliances. However, EPA believes that regulating these substances under section 608, and in particular requiring that the practices currently in place for class I and class II refrigerants be applied to these substances, would not provide additional substantial public health or environmental protection, since the use and release of these compounds are adequately addressed by other authorities.

3. Hydrocarbons

In the NPRM, EPA proposed to find that the release of hydrocarbon (HC) refrigerants during the servicing and disposal of such systems does not pose a threat to the environment under section 608, because the use of HC refrigerants as substitutes

for class I or class II ODS refrigerants is limited and the releases are adequately controlled by other authorities. EPA requested comment on this proposed finding and on the rationale behind it.

Commenters expressed concern that the NPRM was deficient, in that it did not include a mechanism to address alternative or future applications for hydrocarbons (e.g., hydrocarbon technology in household refrigeration).

Under SNAP, EPA has approved hydrocarbon refrigerants as substitutes for class I or class II ODS refrigerants only for use in industrial process refrigeration systems.[6] Therefore, it is illegal to use a hydrocarbon refrigerant as a substitute for a class I or class II ODS refrigerant for any end use other than industrial process refrigeration systems.

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[6]Under SNAP, EPA restricts the use of hydrocarbon refrigerants as substitutes for ozone-depleting refrigerants to industrial process refrigeration systems and recommends (but does not require) that hydrocarbon refrigerants only be used at industrial facilities which manufacture or use hydrocarbons in the process stream (March 18, 1994; 59 FR 13076).

Commenters generally supported EPA's determination that the release of hydrocarbon refrigerants during the servicing, maintenance, repair, and disposal of appliances does not pose a threat to the environment under section 608(c)(2). Commenters noted that hydrocarbon refrigerants are regulated appropriately as criteria pollutants and/or hazardous air pollutants.

Hydrocarbons are volatile organic compounds (VOCs) that degrade in the lower atmosphere, contributing to ground-level (or tropospheric) ozone, also referred to as smog. Unlike stratospheric ozone, which forms naturally in the upper atmosphere and protects us from the sun's harmful ultraviolet rays, ground-level ozone is created through the interactions of man-made (and natural) emissions of VOCs and nitrogen oxides in the presence of heat and sunlight. Ground-level ozone does not deplete the stratospheric ozone layer; but when inhaled (even at very low levels), ozone can cause acute respiratory problems; aggravate asthma; cause significant temporary decreases in lung capacity in some healthy adults; cause inflammation of lung tissue; and impair the body's immune system defenses, making people more susceptible to respiratory illnesses, including bronchitis and pneumonia; and reduce agricultural yields for many economically important crops (e.g., soybeans, kidney beans, wheat, cotton). The scientific support papers referenced in the National Ambient Air Quality Standards (NAAQS) for Ozone (62 FR 38856) describe numerous documents that identify and discuss the adverse environmental and health effects of ground-level ozone.

Propane, ethane, propylene, and to some extent butane are used as refrigerants in specialized industrial applications, primarily in oil refineries and chemical plants. In these applications they are frequently available as part of the process stream, and their

use contributes only a slight additional increment to the overall risk of fire or explosion. Such systems are generally designed to comply with the safety standards required for managing flammable chemicals. In this application, hydrocarbons have the potential to come into contact with workers, the general population, and the environment.

Occupational exposures to hydrocarbons are primarily controlled by OSHA requirements and national and local building and fire codes. As noted above, OSHA has established a PEL for propane of 1,000 ppm, and NIOSH has established an Immediately Dangerous to Life and Health (IDLH) limit of 20,000 ppm and 50,000 ppm for propane and butane respectively. The PEL is an enforceable standard, and the IDLHs trigger OSHA personal protective equipment requirements. OSHA's Process Safety Management, confined space entry, and HAZWOPER requirements apply to all hydrocarbon refrigerants. These requirements include employee training, emergency response plans, air monitoring, and written standard operating procedures.

Certain hydrocarbons (including butane, cyclopropane, ethane, isobutane, methane, and propane) are listed as regulated substances for accidental release prevention under regulations promulgated under section 112(r) of the Act. In addition, hydrocarbons are considered VOCs, and are therefore subject to State VOC regulations implemented in accordance with the Act.

ASHRAE 15 prohibits the use of hydrocarbon refrigerants except in laboratory and industrial process refrigeration applications. Refrigeration machinery must be contained in a separate mechanical equipment room that complies with the requirements for HFC equipment rooms and also complies with several fireproofing requirements.

According to industry and OSHA representatives, current industry service practices for hydrocarbon refrigeration equipment include monitoring efforts, engineering controls, and operating procedures. System alarms, flame detectors, and fire sprinklers are used to protect process and storage areas. Fugitive emissions monitoring is routinely conducted, and leak repairs are attempted within five days. If initial repair attempts are unsuccessful, the system is shut down, unless releases from a shutdown are predicted to be greater than allowing a continued leak. During servicing, OSHA confined space requirements are followed, including continuous monitoring of explosive gas concentrations and oxygen levels.

Hydrocarbon refrigerants may be returned to the product stream or can be released through a flare during servicing. Due to fire and explosion risks and the economic value of the hydrocarbon, direct venting is not a widely used procedure. In general, hydrocarbon emissions from refrigeration systems are likely to be significantly smaller than those emanating from the process and storage systems, which are already well-controlled for safety reasons.

Because the release of hydrocarbons from industrial process refrigeration systems is adequately addressed by other authorities, EPA determines that the release of hydrocarbon refrigerants during the servicing and disposal of such systems does not pose a threat to the environment under section 608(c)(2) of the Act. Today's determination does not endorse the venting of hydrocarbon refrigerants. The Agency supports responsible handling of these refrigerants during the service, maintenance, repair, and disposal of appliances. However, EPA believes that regulating these substances under section 608, and in particular requiring that the practices currently in

place for class I and class II refrigerants be applied to these substances, would not provide additional substantial public health or environmental protection, since the use and release of these compounds are adequately addressed by other authorities.

The determination that the release of hydrocarbon refrigerants does not pose a threat to the environment only applies to the end-use sector for which hydrocarbon refrigerant substitutes are approved, namely industrial process refrigeration. Therefore the venting prohibition does not apply for hydrocarbon substitutes in non-approved applications (e.g., comfort cooling or motor vehicle air-conditioning), since their use as a substitute in other end-use sectors is illegal.

4. Inert Atmospheric Constituents

In the NPRM, EPA proposed to find that the release or disposal of CO_2 refrigerant during the servicing and disposal of appliances does not pose a threat to the environment under section 608. EPA also requested comment on the factual basis for this proposal.

Under SNAP, EPA has approved CO_2 as a replacement for CFC-13, R-13b1 and R-503 in very low temperature and industrial process refrigeration applications. EPA has also approved CO_2 as a substitute for R-113, R-114, and R-115 in non-mechanical heat transfer applications. Carbon dioxide is a well-known, nontoxic, nonflammable gas. Its GWP is defined as one, and all other GWPs are indexed to it. EPA's understanding is that CO_2 is readily available as a waste gas, and therefore no additional quantity of CO_2 needs to be produced for refrigeration applications. Thus, the use and release of such commercially available CO_2 as a refrigerant would have no net contribution to global warming.

EPA has approved direct nitrogen expansion as an alternative technology for many CFC and HCFC refrigerants used in vapor compression systems. Nitrogen is a well-known, nontoxic, nonflammable gas that makes up 78 percent of the Earth's atmosphere. Nitrogen contributes neither to global warming nor to ozone-depletion.

EPA has approved evaporative cooling as an alternative technology for MVACs using CFC-12 as a refrigerant. Evaporative cooling operates simply through the evaporation of water to the atmosphere. Water released from evaporative cooling is nontoxic and contributes neither to ozone-depletion nor to global warming. Furthermore, EPA has determined that the use of water or air as a coolant is not included under the definition of "refrigerant."

EPA received no comments in opposition to the proposal to exempt inert atmospheric constituents from the venting prohibition. Therefore, EPA determines that the release of CO_2 refrigerant, elemental nitrogen, or water during the maintenance, service, repair, and disposal of appliances does not pose a threat to the environment under section 608, and therefore their uses as substitute refrigerants are exempt from the venting prohibition. The finding for the use of CO_2 only applies to the SNAP-approved end-uses for CO_2, namely very low temperature and industrial process refrigeration applications.

IV. THE FINAL RULE

A. Overview

EPA is promulgating regulations that identify substitute refrigerants that are exempt from the section 608 venting prohibition, because the Agency finds that their release does not pose a threat to the environment. For all substitute refrigerants other

than those specifically identified as not posing a threat to the environment, it remains unlawful pursuant to Section 608(c)(2) to knowingly vent, release, or dispose of such substance in a manner that permits it to enter the environment.

In the NPRM, EPA proposed, and in today's action has made changes to a number of the regulations covering CFC and HCFC refrigerants. Several of these changes are intended to accommodate the growing number of refrigerants, including newer blended HFC/HCFC substitutes, that are subject to the regulations because they consist of a class II ODS. For refrigerant substitutes consisting of a class I or class II ODS, EPA is mandating identical required practices and clarifying the prohibitions promulgated at 40 CFR 82, subpart F. Such changes include the adoption of evacuation requirements based solely on the saturation pressures of refrigerants, the requirement for service apertures on appliances, mandatory certification of service technicians, and the restriction on the sales of such blended refrigerants.

EPA is not, however, finalizing the proposal to extend all of the regulations concerning emissions reduction of CFC and HCFC refrigerants, found at 40 CFR 82, subpart F, to HFC and PFC refrigerants. Therefore, today's rule does not mandate any of the following proposed requirements for HFC or PFC refrigerants that do not consist of a class I or class II ODS (i.e., pure HFC or PFC refrigerants): a sales restriction on HFC or PFC refrigerants; specific evacuation levels for servicing HFC or PFC appliances; certification of HFC or PFC recycling and recovery equipment; certification of technicians who work with HFC or PFC appliances; reclamation requirements for used HFC and PFC refrigerants; certification of refrigerant reclaimers who reclaim only HFCs or PFCs; or leak repair requirements for HFC and PFC appliances.

EPA intends to address in future rulemakings other components of the NPRM, such as the use of representative refrigerants from saturation pressure categories for certifying recycling and recovery equipment and adoption (with modification) of the ARI 740 industry recovery/recycling equipment standard, which includes a number of refrigerants that were omitted from its predecessors.

EPA also proposed to reduce the maximum allowable leak rates for appliances containing more than 50 pounds of an ODS refrigerant; changes to the leak repair requirements promulgated at §82.156(i), the associated recordkeeping provisions at §82.166(n) and (o), and the definition of "full charge" at §82.152; and a proposed definition for "leak rate" under §82.152 for the purposes of §82.156(i). The leak repair provisions will also be finalized in a separate rulemaking. EPA believes that addressing these components in separate rulemakings will simplify today's action, by focusing on the determination of which refrigerant substitutes pose a threat to the environment.

B. Application of the Venting Prohibition and Required Practices to Substitute Refrigerants

1. HFC and PFC Refrigerants

While EPA is not finalizing the proposal to extend the full regulatory framework for CFC and HCFC refrigerants to HFC and PFC refrigerants, the Agency emphasizes that since no determination has been made that their release does not pose a threat to the environment, the statutory venting prohibition applies to these refrigerants.

2. Chemically Active Common Gases

EPA determines that for the purposes of section 608, the release of chlorine and ammonia refrigerants does not pose a threat to the environment, because the release of

these refrigerants during the maintenance, service, repair, and disposal of appliances is adequately controlled by other authorities in the air-conditioning and refrigeration applications where they are currently used. Therefore, the venting prohibition does not apply to these substances in those applications, and the Agency is not adopting recycling requirements for these refrigerants at this time. EPA's findings apply to current SNAP-identified end uses only (www.epa.gov/ozone/snap/index.html). If ammonia and chlorine refrigerants are granted approval under SNAP for use in other applications, EPA will evaluate whether regulations governing their use under section 608 should apply in those applications.

3. Hydrocarbons

EPA determines that for the purposes of section 608, the release of hydrocarbons during the maintenance, repair, service and disposal of appliances does not pose a threat to the environment, because such releases are adequately controlled by other authorities. Therefore, the venting prohibition does not apply to these substances and the Agency is not adopting recycling requirements for these refrigerants at this time. EPA's findings apply to current SNAP-identified end uses only (www.epa.gov/ozone/snap/index.html). If hydrocarbon refrigerants are granted approval under SNAP for applications other than industrial process refrigeration, EPA will evaluate whether regulations governing their use under section 608 should apply in those applications.

C. Definitions

1. Appliance

In the NPRM, EPA proposed to amend the definition of “appliance” to include air-conditioning and refrigeration equipment that contain class I and class II ODSs and their substitutes. The proposed amendment to the definition of appliance did not have an effect on its applicability to all air-conditioning and refrigeration equipment except for those designed and used exclusively for military applications; hence, the definition includes: household refrigerators and freezers, commercial refrigeration appliances, other refrigeration appliances (such as refrigerated cargo compartments of trucks), residential and light commercial air-conditioning, motor vehicle air conditioners, comfort cooling in vehicles not covered under section 609, and industrial process refrigeration.

EPA received comment stating that the Act defines the term “appliance,” and for the purposes of the 608 refrigerant recycling rule. The commenter requested that the Agency either eliminate or revise its proposed definition of “appliance” to match the statute. The commenter feared that the Agency might include as an appliance equipment that doesn’t use a refrigerant, as specified in section 608 of the Act, and noted that this is an important clarification because some substances have many different refrigerant and non-refrigerant uses.

EPA also received comments opposed to the inclusion of motor vehicle air conditioners (MVACs) in the definition of appliance. The commenters stated that there is no evidence that Congress intended to include MVACs as “appliances” to be regulated under sections 601(1) or 608(c)(2). A commenter argued that only section 609, which specifically authorizes regulation of MVACs, authorizes regulation of MVACs. The commenter emphasizes that neither section 601(1) or 608(c)(2) includes motor vehicle air-conditioners as an example of an “appliance.” Therefore, the

commenter argued that EPA does not have authority to regulate MVACs as an appliance under section 608.

In the 1993 final rulemaking (58 FR 28660), "appliance" was defined at §82.152, as "any device which contains and uses a class I or class II substance as a refrigerant and which is used for household or commercial purposes, including any air conditioner, refrigerator, chiller, or freezer." The preamble discussion in section III.E. concerning the definition of "appliance" (May 14, 1993; 58 FR 28660) discussed in detail the Agency's rationale for inclusion of MVAC in the definition of "appliance." While the preamble language discussed the inclusion of MVAC, the final definition did not explicitly include MVAC. Since 1993, EPA has consistently interpreted MVAC to be included under the definition of appliance.

The preamble to the proposed rule states: "EPA is proposing to amend the current definition of 'appliance' to include air-conditioning and refrigeration equipment that contains *substitutes* for class I and class II substances, as well as equipment that contains class I and class II substances." [emphasis added] (63 FR 32053). EPA proposed to continue to interpret "appliance" to include all air-conditioning and refrigeration equipment except that is designed and used exclusively for military applications. Thus, the term "appliance" includes household refrigerators and freezers (which may be used outside the home), other refrigeration appliances, residential and light commercial air-conditioning, motor vehicle air-conditioners, comfort cooling in vehicles not covered under section 609, and industrial process refrigeration (63 FR 32053).

EPA proposed to delete the phrase "a class I or class II substance as" leaving

simply the reference to “refrigerant,” which would have encompassed both class I and class II substances and substitutes for such substances. EPA proposed no other amendments to the definition of “appliance.” EPA refers readers to the May 14, 1993 rulemaking 1993 (58 FR 28660) for detailed discussion of the inclusion of MVAC in the Agency’s interpretation of the definition of appliance.

EPA is amending the definition of “appliance” to include air-conditioning and refrigeration equipment that contain substitute refrigerants consisting of a class I or class II substance. The amended definition now reads, “*Appliance* means any device which contains and uses a refrigerant and which is used for household or commercial purposes, including any air conditioner, refrigerator, chiller, or freezer.” EPA will continue to interpret "appliance" to include all air-conditioning and refrigeration equipment, except that designed and used exclusively for military applications. Thus, the term "appliance" includes household refrigerators and freezers (which may be used outside the home), other refrigeration appliances, residential and light commercial air-conditioning, motor vehicle air conditioners (MVACs), comfort cooling in vehicles not covered under section 609 (such as buses using R-22), electrical transformers, secondary refrigeration loops, and industrial process refrigeration equipment.

a. One-Time Expansion Devices, Including Self-Chilling Cans

While EPA proposed to exempt some substitute refrigerants in one-time expansion applications from the section 608 requirements, because their release does not pose a threat to the environment (see the discussion of CO_2 above), EPA did not propose and cannot make this finding for the HFC refrigerants that have been suggested for use in one-time expansion devices.

One-time expansion devices are appliances, and the release of substitute refrigerants from such appliances is prohibited by section 608(c)(2), unless EPA finds that the release of these refrigerants does not pose a threat to the environment. One-time expansion devices, which include “self-chilling cans,” rely on the release and associated expansion of a compressed refrigerant to cool the contents (e.g., a beverage) of a container. EPA considers refrigerant releases from such devices to be prohibited by section 608(c). First, the refrigerant in these devices acts as a not-in-kind substitute for CFCs and HCFCs in household and commercial refrigerators. Although the refrigerant in a one-time expansion device is not being used in the same system as CFC-12 in a household or commercial refrigerator, it is providing the same effect of cooling the container. EPA has previously considered not-in-kind technologies, such as evaporative cooling, to be substitutes under SNAP. The SNAP regulation defines "substitute or alternative" as "any chemical, product substitute, or alternative manufacturing process, whether existing or new, intended for use as a replacement for a class I or II compound."

This approach is consistent with the language of section 612 of the Act, in which Congress repeatedly identified "product substitutes" as substitutes for class I and class II substances. Section 612(a) states the policy of the section: "To the maximum extent practicable, class I and class II substances shall be replaced by chemicals, product substitutes, or alternative manufacturing processes that reduce overall risks to human health and the environment.”[7] As stated in the SNAP regulation, EPA has interpreted

[7]Section 612(b)(3) directs EPA to "specify initiatives. . . to promote the development

the phrase "substitute substances" in 612(c) to incorporate the general definition of substitute in 612(a) and 612(b)(3) and (4) (59 FR 13050). As noted above, the definition of “substitute” in today’s action is very similar to that in the SNAP regulations, except the definition omits the proviso that the substitute be intended for use as a replacement for a class I or class II substance. Thus, under the definition in today’s action and consistent with the definition in the SNAP regulations and section 612 of the Act, EPA considers the refrigerant in a one-time expansion device to be a "substitute substance" under section 608(c)(2).

Secondly, one-time expansion devices, which rely on the release of compressed gases to cool the contents of containers, are encompassed by the term "appliance." A one-time expansion device is a device that holds and uses a substitute substance to make the contents of the container cool for individual consumption. Thus, it is a "device which contains or uses" a "refrigerant" "for household or commercial purposes." The operating principle of a one-time expansion device is the same as that of a traditional refrigerator, that is vapor compression and expansion. The difference between a one-time expansion device and a traditional refrigerator is that, with a one-time expansion device, the compression part of the vapor-compression/expansion cycle takes place at the factory, and the refrigerant escapes during expansion instead of being cycled back

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and use of safe substitutes for class I and class II substances, including alternative chemicals, product substitutes, and alternative manufacturing processes" (emphasis added). Similarly, §612(b)(4) requires EPA to "maintain a public clearinghouse of alternative chemicals, product substitutes, and alternative manufacturing processes."

to a compressor to be recompressed.

Thirdly, EPA believes that the act of opening a one-time expansion device constitutes disposal of the device. This interpretation is consistent with the definition of "disposal" included in the recycling and emissions reduction regulations at § 82.152. “Disposal” is "the process leading to and including:

- The discharge, deposit, dumping or placing of any discarded appliance into or on any land or water;
- The disassembly of any appliance for discharge, deposit, dumping or placing of its discarded component parts into or on any land or water; or
- The disassembly of any appliance for reuse of its component parts.”

Opening the device irreversibly discharges the refrigerant and thereby ends the useful life of the cooling device. Cooling the container is a one-time action that occurs immediately prior to consuming or using its contents, after which the remaining component parts of the appliance will be discarded. In addition, with the irreversible discharge of the critical portion of the cooling device, the appliance has been partially disassembled and one of its component parts has been discharged. Thus, the act of opening the device and cooling the container is a process that leads quickly and inevitably to the final disposal of the appliance, and the act itself includes the permanent disassembly of the appliance and discharge of one of the component parts. Finally, the act of opening the device is a “knowing” release of refrigerant, as a person opening the device could not fail to be aware that his or her action is causing release of a gas to the atmosphere. Thus, the release occurs in the course of "maintaining, servicing, repairing, or disposing of an appliance" and is subject to the venting prohibition.

One commenter believed that the Agency's interpretation of one-time expansion device is flawed, because it is so broad that it would include equipment that the Agency would not want to regulate, such as fire extinguishers. The commenter requested EPA to state specifically that EPA intends to ban self-chilling beverage cans.

For purposes of clarity, the Agency has determined that one-time expansion devices, which include "self-chilling cans," that rely on the release and associated expansion of a compressed refrigerant to cool the contents (e.g., a beverage) of a container, are considered appliances. Any one-time expansion device that does not rely on the release and expansion of a refrigerant for cooling purposes would not fall under the definition of appliance. In addition, EPA reminds readers that the final rule published on March 5, 1998 (63 FR 11084) prohibits the intentional release of any class I ODS (i.e., Halon 1211, Halon 1301, and Halon 2402) during the testing, repairing, maintenance, servicing, or disposal of halon-containing equipment. The rule became effective April 6, 1998.

b. Secondary Loops

Rather than cooling things or people directly, many refrigeration and air-conditioning systems operate by cooling an intermediate fluid, which is then circulated to the things or people to be cooled. This intermediate fluid (and the structure for transporting it) is referred to as a secondary loop. Secondary loops are commonly used in comfort cooling chillers, industrial process refrigeration equipment, and some specialty and commercial refrigeration systems.

The definition of "appliance" with respect to secondary loops is somewhat ambiguous under the Act. Given this ambiguity, EPA proposed to interpret as part of an

“appliance," refrigerant loops that (1) are primary or (2) move heat from cooler to warmer areas or (3) involve a change of state of the fluid. In the proposal, EPA requested comment on its interpretation of “appliance” as it applies to secondary loops. Specifically, EPA requested comment on whether there are human health or environmental risks that could be significantly reduced by subjecting to the venting prohibition secondary loops that transport heat from warmer to cooler areas without a change of state. EPA also requested comment on the extent to which ozone depleting substances, such as HCFC-123, are used in secondary loops that transport heat from warmer to cooler areas.

The majority of comments received in response to EPA’s requests, recommended that secondary loops containing a regulated refrigerant be covered under the provisions of the section 608 recycling regulations. The majority of commenters agreed with the Agency’s decision to include, under the definition of appliance, refrigerant loops that are primary to the system or secondary involving a change of state of refrigerant, while excluding secondary loops that do not involve a change of state.

EPA received no comments in response to the proposal’s request for information concerning the extent to which ozone depleting substances, such as HCFC-123, are used in secondary loops that transport heat from warmer to cooler areas or the need to require recovery of such substances used in secondary loops. The Agency believes that it is not necessary to specify secondary loops using regulated refrigerants as part of an appliance, since they are already subject to the section 608(c) venting prohibition. Therefore, EPA is interpreting “appliance” consistent with the language and purpose of section 608, and that it is reasonable to interpret as part of an “appliance” refrigerant

loops that (1) are primary or (2) involve heat transfer with a change of state. Such systems may include cascade systems, electric transformers, or any secondary loop containing a regulated refrigerant. Under this interpretation, secondary loops that use substances not covered under the definition of refrigerant (as defined at §82.152) such as water, brine, and glycol solutions thereof will not be considered to be part of an "appliance."

EPA believes that this interpretation covers those secondary loops, using a class I or class II ODS as a refrigerant, that have traditionally been considered to be part of the air conditioner or refrigerator, while excluding those that are not. Furthermore, this interpretation excludes for the definition of appliance air-conditioning and refrigerating components that do not use an ODS. Thus, EPA believes that this interpretation is consistent with Congress' intent regarding the scope of EPA's regulatory authority over "appliances."

This interpretation is also consistent with EPA's decision not to list secondary fluids under SNAP. In that decision, published in

SNAP Notice 6 (62 FR 10700; March 10, 1997), EPA expressed concern that due to the large number of secondary fluids, any

listing of secondary fluids could discourage their use and could be very burdensome to the Agency and the regulated comm

unity. In addition, the Agency noted that there was little information or data suggesting that the use of these fluids in

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2. Full Charge

While EPA had proposed changes to the definition of full charge as it relates to the leak repair required practices found at §82.156, the Agency has decided to address this definition, including public comments concerning the definition in a separate rulemaking dedicated to finalizing the leak repair components of the NPRM. Based on the comments received, EPA believes that this issue will be more appropriately addressed separately.

3. High-pressure Appliance (proposed as higher-pressure appliance)

In the NPRM, EPA proposed to create a new category of “higher-pressure appliance” whose refrigerants have saturation pressures between 220 psia and 305 psia at 104 °F. Appliances in this category would be subject to the original evacuation requirements for HCFC-22 appliances.

While EPA received supporting comments concerning the proposed definition of the higher-pressure appliance category, the Agency received a request to change the category name to “high-pressure appliance.” The commenter stated that this change reflects common field nomenclature and would avoid confusion.

EPA agrees with the commenter and today is finalizing a new category of “high-pressure appliance.” These appliances contain refrigerants with saturation pressures between 170 psia and 355 psia at 104 °F. This category was proposed as the “higher-pressure appliance” category, but the category name was changed to reflect common field nomenclature and to remain as close as possible to the ARI groupings for the ARI Standard 740 for refrigerant recovery and recycling equipment. The Agency has changed the dividing lines to 170 psia and 355 psia in an effort to retain consistency between the previous evacuation requirements and the procedures used for certification of recovery equipment used to obtain the evacuation levels. As discussed in greater detail below, EPA has altered the classification scheme by eliminating the special evacuation category for R-22 and replacing it with a new saturation pressure category that includes the "high-pressure" refrigerants with saturation pressures between 170 psia and 355 psia at 104 °F. This change enables EPA to tailor requirements to refrigerants with relatively high saturation pressures, while retaining the long standing evacuation requirements for appliances using R-22 refrigerant.

Appliances in this category are subject to the same requirements previously reserved for HCFC-22 appliances. This action’s definition of “refrigerant” limits the applicability of the high-pressure appliance definition to appliances that use a CFC or

HCFC refrigerant, or a blend containing a CFC or HCFC refrigerant, with a liquid phase saturation pressure between 170 psia and 355 psia at 104 °F. The definition of "high-pressure appliances" reads as follows: *High-pressure appliance means an appliance that uses a refrigerant with a liquid phase saturation pressure between 170 psia and 355 psia at 104 °F. This definition includes but is not limited to appliances using R-401A, R-409A, R-401B, R-411A, R-22, R-411B, R-502, R-402B, R-408A, and R-402A.*

4. Leak Rate

While EPA had proposed to officially define "leak rate" in the NPRM for purposes of clarity when applying the leak repair requirements contained in §82.156(i), the Agency has decided to address this definition, including public comments concerning the definition in a separate rulemaking dedicated to finalizing the leak repair components of the NPRM. Based on the comments received, EPA believes that this issue will be more appropriately addressed separately.

5. Low-pressure Appliance

In the NPRM, EPA proposed to revise the definition of "low-pressure appliance" to refer to saturation pressures at 104 °F rather than boiling points. This proposal to define low-pressure appliances according to saturation pressure was intended in part to make it easier for technicians to remember and implement when compared to standards that varied both by saturation pressure and type of refrigerant. Without such a change, the number of new evacuation categories could conceivably have been doubled by the influx of new substitute refrigerants.

The Agency received no comments concerning the proposed revision.

Therefore, EPA has revised the definition of “low-pressure appliance” to refer to saturation pressures at 104 °F rather than boiling points. The revised definition reads: *Low-pressure appliance means an appliance that uses a refrigerant with a liquid phase saturation pressure below 45 psia at 104 °F. This definition includes but is not limited to appliances using R-11, R-123, and R-113.*

6. Opening

In the NPRM, EPA proposed to amend the definition of “opening” to include service, maintenance, or repair of an appliance that would release class I, class II, or substitute refrigerants unless the refrigerant were recovered previously from the appliance. EPA also requested comment on adding disposal to the definition of “opening.”

EPA received one comment representing the scrap and recycling industry in opposition to adding the term “or disposal” to the definition of “opening.” The commenter was opposed on the grounds that the NPRM did not distinguish between recycling and disposal.

Sections 608 (b)(1) and 608(c)(2) of the Act require that class I, class II, and their substitute refrigerants contained in bulk in appliances be removed from the appliance prior to disposal or their delivery for recycling. The Agency does not interpret this statutory language to mean that scrap recyclers who choose to dispose of appliances or choose to accept appliances (or their parts) with refrigerant charges intact are exempt from the Required Practices codified at §82.156 (including the acquisition of recovery equipment that meets the standards set forth in §82.158). EPA refers readers to the

May 14, 1993 rulemaking 1993 (58 FR 28660) for detailed discussion of the Agency's long standing interpretation of scrap metal recycling's inclusion in the term "final disposal."

Therefore, EPA has amended the definition of "opening" to include any service, maintenance, repair, or disposal of an appliance that would release refrigerant from the appliance to the atmosphere unless the refrigerant was recovered previously from the appliance. Connecting and disconnecting hoses and gauges to and from the appliance to measure pressures within the appliance and to add refrigerant to or recover refrigerant from the appliance shall not be considered "opening."

7. Reclaim

In the NPRM, EPA proposed to amend the definition of "reclaim" to reflect the update of the refrigerant standards at Appendix A from standards based on ARI Standard 700-1993 to standards based on ARI Standard 700-1995. In addition, EPA proposed to amend the definition of "reclaim" to remove the reference to a "purity" standard and thereby make the definition more consistent with the full range of requirements provided in Appendix A. EPA amended the definition of "reclaim" in the related Industrial Recycling Guide (IRG)-2 final rule (68 FR 43786), by adopting the 1995 version of the ARI Standard 700. Today's action makes no further amendment to the definition of "reclaim."

8. Refrigerant

In the NPRM, EPA proposed to add a definition of "refrigerant" that would include any class I or class II substance used for heat transfer purposes or any substance used as a substitute for such a class I or class II substance by any user in a given end-use,

except: ammonia in commercial or industrial process refrigeration or in absorption units; hydrocarbons in industrial process refrigeration (processing of hydrocarbons); chlorine in industrial process refrigeration (processing of chlorine and chlorine compounds); carbon dioxide in any application; nitrogen in any application; or water in any application. As discussed above, EPA proposed to interpret "appliance" to exclude secondary loops that move heat from warmer to cooler areas using a fluid that does not change state. EPA also requested comment on the Agency's proposal to add a restriction to the definition of "refrigerant" to the same effect, ensuring consistency between the interpretation of "appliance" and the definition of "refrigerant."

Several commenters stated that the proposed definition of refrigerant was too broad. Commenters stated that the definition should not encompass substances that are not actually used as refrigerants, such as air, water or brine used in secondary loops. One commenter suggested that the Agency revise the definition of refrigerant to clarify that the recycling rule does not apply to systems that provide heat. The commenter expressed concern that the definition of refrigerant contained the phrase "for heat transfer purposes," and stated that although heat transfer can cool a system, it can also warm a system and provide heating, and in these cases the substance is not being used as a refrigerant. The commenter noted that in the CAA, Congress always used words related to cooling when referring to refrigeration and never intended to regulate heating. Similarly, a number of commenters supported defining refrigerant in terms of phase change and to exclude secondary loops that do not involve change of state in order to ensure that substances that are not actually used as refrigerants are not encompassed in the definition.

With today's rule EPA is defining "refrigerant" as follows: "*Refrigerant* means, for purposes of this Subpart, any substance consisting in part or whole of a class I or class II ozone-depleting substance that is used for heat transfer purposes and provides a cooling effect, or any substance used as a substitute for such a class I or class II substance by any user in a given end-use, except for the following substitutes in the following end-uses: (1) Ammonia in commercial or industrial process refrigeration or in absorption units; (2) Hydrocarbons in industrial process refrigeration (processing of hydrocarbons); (3) Chlorine in industrial process refrigeration (processing of chlorine and chlorine compounds); (4) Carbon dioxide in any application; (5) Nitrogen in any application; or (6) Water in any application." This definition also excludes air from the definition of refrigerant.

EPA has defined "refrigerant" to simplify the text of the regulations. The definition permits EPA to refer to covered class I, class II, and substitute refrigerants without having to reiterate a list of either included or excepted refrigerants each time. EPA believes that this definition appropriately defines "refrigerant" for purposes of section 608, and has revised the proposed definition of "refrigerant" by adding the phrase "that provide a cooling effect" to make certain that the definition does not capture substances that provide for heat transfer but do not provide a cooling effect. This definition removes any ambiguity for substances that may provide a cooling effect but are not considered refrigerants under section 608. The Agency does not intend the definition to either expand or diminish the scope of the section 608 requirements, and believes that the definition is consistent with EPA's past interpretations of the term "refrigerant."

In the past, EPA has interpreted “refrigerants” to include the class I and class II fluids in traditional vapor-compression systems, such as refrigerators, air-conditioners, and heat pumps, as well as the class I and class II fluids in heat transfer systems that lack compressors, such as electrical transformers. At the same time, the Agency has not considered substances whose use as refrigerants have been denied under SNAP (such as hydrocarbons outside of industrial process refrigeration), to fall under the definition of “refrigerant.” EPA has adopted this interpretation based on both technical and common definitions of “refrigerant.” The Agency believes that the definition addresses the ODSs and substitutes covered by the technical and common definitions of refrigerant. Therefore, the Agency has not added the phrase “including a change of state” to the definition of refrigerant.

9. Substitute

In the NPRM, EPA proposed to define “substitute” as any chemical or product substitute, whether existing or new, that is used by any person as a replacement for a class I or II ODS in a given end-use. Several commenters objected to classifying a substance as a substitute refrigerant, when in a specific refrigeration system the substance has not replaced any class I or class II ODS refrigerant as a second

generation substitute.[8]

If the Agency were to take this approach, a substitute would be regulated only if the equipment owner/operator previously used the substance as a direct replacement for a class I or class II substance (for example, during the retrofit of an appliance from HCFC to an HFC blend), and an identical substitute refrigerant used by a different entity would not be regulated if it were a replacement for a non-ODS refrigerant (regardless of the generation of the substitute). EPA believes that a lack of regulatory conformity among substitute refrigerants, regardless of generation class, would not reduce

[8]By second generation substitute the Agency means a substance being used as a replacement refrigerant for a substitute refrigerant, where the substitute refrigerant was an original SNAP-approved replacement for a class I or II refrigerant (i.e., a first generation substitute).

emissions of substitute refrigerants, would lead to confusion within the regulated community, and would make enforcement difficult. For the purposes of section 608, EPA considers a refrigerant a substitute in a certain end-use, if the substance has SNAP approval as a substitute for CFC or HCFC refrigerants in that end-use by any user. This holds even if the SNAP-approved substitute is being used in a new appliance, and previously has never been used by the owner/operator of the appliance. Under section 608, EPA considers a SNAP-approved refrigerant a "substitute" for CFC or HCFC refrigerants under section 608 if any of the following is the case: (1) the substitute refrigerant immediately replaced a CFC or HCFC in a specific instance, (2) the substitute refrigerant replaced another substitute that replaced a CFC or HCFC in a specific instance (i.e., it was a second- or later-generation substitute), or (3) the substitute refrigerant has always been used in a particular instance, but other users in that end-use have used it to replace a CFC or HCFC.

EPA does not believe that it is appropriate under section 608 to consider the intent or history of an individual user in determining whether a refrigerant is a "substitute" for CFC or HCFC refrigerants in a given instance. First, it is reasonable to interpret "substitute" to include first, second- or later generation substitutes for CFCs and HCFCs. One of the goals of this rulemaking is to minimize any environmental harm that might be associated with the transition away from CFC and HCFC refrigerants. In many cases, the transition away from CFCs and HCFCs is a multi-step process, with substitutes supplanting each other as they are tested and developed. Thus, even if a substance is not being used as a direct or first generation substitute for CFC or HCFC refrigerants in a particular instance, its use is the result of the transition away from

CFCs and HCFCs and the substance serves as a substitute for these substances.

Second, it is also reasonable to interpret "substitute" to mean a refrigerant that is occasionally used as a substitute for CFC or HCFC refrigerants in a given end-use, even if the refrigerant has a history of use by a particular user or in a particular end-use. EPA's authority to promulgate enforceable regulations would be impeded if the Agency had to attempt to trace the individual histories of specific appliances in implementing and enforcing the section 608 regulations.

Several commenters expressed concern that a refrigerant could become a substitute without notice or rulemaking. One scenario was described as a first-generation refrigerant used in an industrial process by one user becoming a regulated substitute by its use as a replacement for a class I or class II refrigerant by another unrelated user.

This scenario is covered by the third leak repair scenario discussed in the NPRM (63 FR 32070) by which EPA would consider a refrigerant a "substitute" for CFCs or HCFCs under section 608. A legally used first-generation refrigerant used as a substitute by any end-user is already authorized under section 612 of the Act. Appropriate notice via rulemaking under SNAP would have taken place prior to the substitute's use in the specific end-use sector. On March 18, 1994, EPA published a final rule (59 FR 13044), that described the process for administering SNAP and issued EPA's first acceptability lists for substitutes in the major industrial use sectors, including refrigeration and air-conditioning. Anyone who produces a substitute must notify the Agency at least 90 days before introducing it into interstate commerce for use as an alternative. This requirement applies to chemical manufacturers, but may include

importers, formulators or end-users when they are responsible for introducing a substitute into commerce. Therefore, in the commenter's scenario proper notice would have been granted for any approved substitute. Formulators or end-users concerned about the status of their refrigerant need to verify the refrigerant's acceptability under SNAP. Such verification can be made by checking the EPA webpage (www.epa.gov/ozone) or contacting the Ozone Hotline (800-296-1996) for a complete listing of SNAP determinations.

One commenter believed that the proposed rule contradicts the Agency's final rule addressing the reporting requirements for substitutes under the SNAP (March 18, 1994; 59 FR 13044). In that rule, the Agency determined that second-generation replacements, if they are non-ozone depleting and are replacing non-ozone-depleting first-generation alternatives, are exempt from reporting requirements under section 612 of the Act.

The SNAP final rule does not grant an exemption from the venting prohibition established under 608(c) of the Act, and section 612 does not impose any reporting or recordkeeping requirements associated with the venting prohibition. Section 612 of the Act authorizes EPA to develop a program (i.e., SNAP) for evaluating alternatives to ODSs, whereas section 608 of the Act authorizes EPA to write regulations reducing emissions of class I and class II refrigerants and their substitutes to the lowest achievable level during the service, maintenance, repair, and disposal of appliances.

EPA is defining "substitute" as any chemical or product, whether existing or new, that is used by any person as an EPA-approved replacement for a class I or II ozone-depleting substance in a given refrigeration or air-conditioning end-use. As discussed

above, this definition is similar to the definition of "substitute" used in the SNAP rule, but it omits the proviso that a substitute be "intended for use as a replacement for a class I or class II substance." Thus, it includes substances that may not have been used to replace class I or class II substances in a given instance, but are used to replace class I or class II substances in other instances of that end-use. This definition of substitute differs from the proposed definition (63 FR 32059) in that the word "compound" has been replaced with "substance" in order to bring the definition of substitute into conformity with the original intent of the proposed rule.

10. Technician

In the NPRM, EPA proposed to amend the definition of "technician" to include persons who perform maintenance, service, repair, or disposal that could be reasonably expected to release class I, class II, or substitute refrigerants from appliances into the atmosphere. One commenter opposed expanding the definition of technician to include those disposing of appliances, unless the Agency properly distinguishes between recycling and disposal.

EPA did not intend for the proposed definition of technician to alter the exclusion of those disposing of MVACs or small appliances from the definition of technician. However, EPA believes that persons disposing of appliances that have not been evacuated, in accordance with §82.156, pose a reasonable risk of releasing refrigerant. The Agency has determined (May 14, 1993; 58 FR 28660) that for purposes of subpart F, disposal means the process leading to and including: (1) The discharge, deposit, dumping or placing of any discarded appliance into or on any land or water; (2) The disassembly of any appliance for discharge, deposit, dumping or placing of its discarded

component parts into or on any land or water; or (3) The disassembly of any appliance for reuse of its component parts. Therefore, any person who performs any of these activities (whether they consider themselves a recycler, scrap dealer, or disposer, etc.) is not exempt from the required practices codified at §82.156.

Two commenters asked that the Agency clarify its definition of technician with respect to “do-it-yourselfers” (DIYers), and clarify that process operators in industrial settings are not considered technicians.

EPA’s amended definition of “technician” includes any person (including DIYers or process operators) who performs maintenance, service, or repair, that could be reasonably expected to release refrigerants from appliances into the atmosphere. Technician also means any person who performs disposal of appliances - except for small appliances, MVACs, and MVAC-like appliances - that could be reasonably expected to release refrigerants from the appliances into the atmosphere. Performing maintenance, service, repair, or disposal could be reasonably expected to release refrigerants only if the activity is reasonably expected to violate the integrity of the refrigerant circuit. Activities reasonably expected to violate the integrity of the refrigerant circuit include, but are not limited to, activities such as: pressure checks by attaching and detaching gauges to and from the appliance, attaching or detaching hoses, or adding refrigerant to and removing refrigerant from the appliance. Activities such as painting the appliance, rewiring an external electrical circuit, replacing insulation on a length of pipe, or tightening nuts and bolts on the appliance are not reasonably expected to violate the integrity of the refrigerant circuit. Performing maintenance, service, repair, or disposal of appliances that have been evacuated in accordance with

§82.156 could not be reasonably expected to release refrigerants from the appliance unless the maintenance, service, or repair consists of adding refrigerant to the appliance. Technician includes but is not limited to installers, contractor employees, in-house service personnel, and in some cases owners and/or operators.

11. Very High-Pressure Appliance

EPA did not receive any negative comments concerning the proposed definition of "very high-pressure appliance" to refer to saturation pressures at 104 °F rather than boiling points.

Since 104 °F is above the critical temperatures[9] of many very high-pressure refrigerants (meaning that there is no "saturation pressure" in the usual sense for those refrigerants at that temperature), EPA is also adding the phrase "or with a critical temperature below 104 degrees Fahrenheit" to the definition. The final definition reads as follows: "Very high-pressure appliance means an appliance that uses a refrigerant with a critical temperature below 104 °F or with a liquid phase saturation pressure above 355 psia at 104 °F. This definition includes but is not limited to appliances using R-13 and R-503."

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[9]Critical temperature is the temperature above which a gas cannot be liquefied by an increase of pressure.

D. Required Practices

In the NPRM, EPA proposed to require persons servicing or disposing of air-conditioning and refrigeration equipment that contain HFC or PFC refrigerants to observe certain service practices that minimize emissions of these refrigerants that are very similar to those required for the servicing or disposal of CFC and HCFC equipment. The most fundamental of these practices is the requirement to recover HFC and PFC refrigerants rather than vent them to the atmosphere. As noted above, the knowing venting of substitutes for class I and class II refrigerants (except those exempted by the Administrator) during maintenance, service, repair or disposal is expressly prohibited by section 608(c)(1) and (2) of the Act, as of November 15, 1995. In order to implement section 608(c)(2) more effectively, EPA proposed not only to define "good faith attempts to recapture and recycle or safely dispose," but also more directly to require compliance with the proposed provisions for substitute refrigerants regarding evacuation of equipment, use of certified equipment, and technician certification in any instance where a person is opening or disposing of an appliance, as defined in §82.152.

EPA is not finalizing the proposed required practices for the handling and use of pure HFC and PFC refrigerant substitutes. However, since EPA is not determining that the release of HFC or PFC refrigerants *does not pose a threat to the environment*, it remains illegal to knowingly vent these substitutes during the maintenance, service, repair, or disposal of appliances. This finding means that efforts to prevent venting such as the proper use of refrigerant recovery equipment are necessary when maintaining, servicing, repairing, or disposing of appliances.

1. Evacuation of Appliances

EPA is not finalizing the proposed evacuation requirements for HFC and PFC appliances that are opened for maintenance, service, repair, or disposal to established levels that are the same as those for CFCs and HCFCs with similar saturation pressures. This action is consistent with EPA's decision to not regulate, under section 608, refrigerants that do not contain a class I or class II ODS. Similarly, EPA is not finalizing the option that would have permitted technicians to recover HFC or PFC refrigerants using equipment certified for use with multiple CFC or HCFC refrigerants of similar saturation pressures. EPA defers discussion of the certification of refrigerant recovery equipment to a future rulemaking.

In today's action, EPA is clarifying that evacuation requirements are applicable to substitute refrigerants that consist, in whole or in part, of a class I or class II ODS. Additionally, evacuation requirements are not applicable to substitutes that have been exempted by today's action namely, ammonia in commercial or industrial process refrigeration or in absorption units; hydrocarbons in industrial process refrigeration; chlorine in industrial process refrigeration; carbon dioxide in any application; nitrogen in any application; water in any application; or air in any application.

EPA is classifying refrigerants according to their saturation pressures at 104 °F, because many of the refrigerants that have entered the market over the past few years pose two difficulties for the existing system based on boiling points. First, many of the new HFC/HCFC blends do not have precise boiling points. Instead, these refrigerants exhibit "glide," (i.e., boiling and condensing over a range of temperatures at a given

pressure). Second, refrigerants' boiling points have served as a surrogate for their saturation pressures at higher temperatures, but the relationship between boiling point and saturation pressure is not as consistent for the new refrigerants as it is for traditional CFCs and HCFCs. For instance, a lower boiling point has generally indicated a higher saturation pressure at a given temperature, but that is not consistently the case with many substitute refrigerants. The new approach avoids these difficulties, because it links evacuation requirements directly to the refrigerant saturation pressure at a temperature similar to that at which recovery typically takes place.

a. Evacuation Requirements for Appliances Other than Small Appliances, MVACs, and MVAC-like Appliances

EPA is not finalizing the proposed extension of the evacuation requirements for appliances (other than small appliances, MVACs, and MVAC-like appliances) containing HFC or PFC refrigerants. However, EPA is amending the system for classifying appliances and clarifying how the evacuation requirements apply to appliances containing substitute refrigerants that consist, in whole or in part, of a class I or class II ODS.

Table I lists the required levels of evacuation for air-conditioning and refrigeration equipment, other than small appliances, MVACs, and MVAC-like appliances. EPA is clarifying that the required evacuation levels apply to refrigerant substitutes that have a class I or class II ODS component (for example, HFC refrigerant blends that contain an HCFC). EPA has amended the table to reflect definition changes for medium-pressure and high-pressure appliances, formerly referred to as high-pressure and higher-pressure appliances respectively. The proposed changes concerning evacuation

requirements for appliances containing substitutes with ODS components are captured and finalized by inclusion of the new definitions for medium-, high-, and very high-pressure appliances in Table 1, which were previously classified according to their boiling points at atmospheric pressure.

Table 1-Required Levels of Evacuation for Appliances

[Except for small appliances, MVACs, and MVAC-like appliances]

Type of appliance	Inches of Hg vacuum (relative to standard atmospheric pressure of 29.9 inches Hg)	
	Using recovery or recycling equipment manufactured or imported before November 15, 1993	Using recovery or recycling equipment manufactured or imported on or after November 15, 1993
Very high-pressure appliance	0	0
High-pressure appliance, or isolated component of such appliance, normally containing less than 200 pounds of refrigerant	0	0
High-pressure appliance, or isolated component of such appliance, normally containing 200 pounds or more of refrigerant	4	10
Medium-pressure appliance, or isolated component of such appliance, normally containing less than 200 pounds of refrigerant	4	10
Medium-pressure appliance, or isolated component of such appliance, normally containing 200 pounds or more of refrigerant	4	15

Low-pressure appliance	25	25 mm Hg absolute

The evacuation requirements in Table 1 are very similar to those that have been in place for appliances containing single component CFC and HCFC refrigerants. The evacuation requirements for CFC and HCFC appliances were based largely, but not entirely, on their saturation pressures. Appliances were classified according to their refrigerant's boiling point at atmospheric pressure, which is generally inversely related to its saturation pressures at higher temperatures. Successively deeper vacuums have been required for lower pressure appliances.

EPA has adopted this approach because the saturation pressure of a refrigerant is directly related both to the percentage of refrigerant that is recovered at a given vacuum level and to the compression ratio that is necessary to achieve that vacuum.[10] A comparison between R-502, which has a saturation pressure of 245 psia at 104° F, and R-11, which has a saturation pressure of 25.3 psia at 104° F, makes this clear. At an evacuation level of 10 inches of mercury vacuum and an ambient temperature of 104°F, 96 percent of R-502 refrigerant vapor has been recovered, but only 61 percent of R-11 refrigerant vapor has been recovered. For R-502, the compression ratio necessary to achieve this vacuum is about 25 to 1, but for R-11 the compression ratio

[10]The saturation pressure of a refrigerant is the same as its vapor pressure, that is, the characteristic pressure of the vapor in a vapor/liquid mixture of that refrigerant at equilibrium at a given temperature. A compression ratio is the ratio of the pressures of a gas on the discharge and suction sides of the compressor.

necessary is only about one tenth of that, 2.6 to 1. Most recovery compressors have a compression ratio limit of between 20 and 30 to 1, meaning that it is difficult to achieve an evacuation level much lower than 10 inches of vacuum for R-502, but that it is easy to achieve a lower evacuation level for R-11. Thus, a refrigerant's saturation pressure directly affects both the technical feasibility and the environmental impact of a given evacuation level.

i. Low-Pressure Appliance Category

EPA is finalizing the proposal to define low-pressure appliances as those using refrigerants with a liquid phase saturation pressure below 45 psia at 104 °F. Evacuation requirements for the low-pressure category apply to these appliances. This category includes but is not limited to appliances using R-113, R-123, and R-11.

ii. Medium-Pressure and High-Pressure (proposed as high- and higher-pressure) Appliance Categories

In the NPRM, EPA sought comment on the proposal to use a saturation pressure of 45 psia as the lower-bound saturation pressure for high-pressure appliances. EPA also sought comment on the proposal to eliminate the special category for R-22 and to replace it with a new saturation pressure category that includes the “high-pressure” refrigerants with the highest saturation pressures (those with boiling points approximately between -40 and -50°C and saturation pressures between 220 psia and 305 psia at 104 °F). EPA proposed to designate this as the “higher-pressure appliances.” EPA also sought comment on the establishment of the “higher-pressure appliance” saturation pressure category. EPA specifically sought comment on the

proposed use of 305 psia as the upper bound saturation pressure for this new category, and whether R-502 was appropriate for this category.

EPA received supportive comments on the establishment of the upper bound saturation pressure for the “high-pressure” saturation pressure category. The pressures to which R-22 appliances must be evacuated (and therefore to which “high-pressure” appliances would have to be evacuated) are 0 inches of vacuum (atmospheric pressure) for appliances containing less than 200 pounds of refrigerant, and 10 inches of vacuum (9.8 psia) for appliances containing more than 200 pounds of refrigerant.

EPA received one comment supporting the inclusion of R-502 (which has a relatively low discharge temperature) in the higher pressure category. The commenter stated that the real-world compression ratio would be lower than the theoretical 30:1 ratio, because the actual condensing conditions during recovery should typically be lower than 104 °F.

EPA has attempted to select bracketing saturation pressures for appliance categories so as to maintain as much consistency as possible with the previous categories based on boiling points. For instance, since the current definition of “medium-pressure appliances” (previously referred to as high-pressure appliances) includes R-114 appliances at the low-pressure end, and the saturation pressure of R-114 at 104 °F is slightly above 45 psia, EPA is implementing a saturation pressure of 45 psia as the lower-bound saturation pressure for medium-pressure appliances.

EPA has altered the classification scheme by eliminating the special category for R-22 and replacing it with a new saturation pressure category that includes the "high-

pressure" refrigerants with saturation pressures between 170 psia and 355 psia at 104 °F). EPA designates this as the "high-pressure" refrigerants category. This change enables EPA to tailor requirements to refrigerants with relatively high saturation pressures, while retaining the previous evacuation requirements for appliances using R-22 refrigerant, as stated in Table 1. The new category includes but is not limited to appliances using R-401A, R-409A, R-401B, R-411A, R-22, R-411B, R-502, R-402B, R-408A, R-402A. For several of these refrigerants, the combination of a relatively high saturation pressure and high discharge temperature makes recovery into a deep vacuum difficult. On the other hand, these refrigerants have significantly lower saturation pressures than still higher pressure refrigerants, such as R-13 and R-503 (whose critical temperatures fall below 104 °F).

iii. Very High-Pressure Appliance Category

In the NPRM, EPA proposed to modify the definition of very high-pressure appliances to add the phrase “or whose critical temperatures fall below 104 °F. EPA also sought comment on the proposal to classify refrigerants based upon saturation pressures at 104 °F rather than boiling points.

As proposed, EPA has modified the definition of very high-pressure appliances to add the phrase “or whose critical temperatures fall below 104 °F.” This modification has been made to address the classification of appliances using very high-pressure refrigerants such as R-13, R-23, and R-503. These refrigerants do not have a saturation pressure in the traditional sense at 104 °F because this temperature is above their critical temperatures. As noted above, the saturation pressure of a refrigerant is

the pressure of the vapor in a vapor/liquid mixture, but refrigerants above their critical temperatures cannot exist in a liquid state regardless of the pressure.

b. Evacuation Levels for Small Appliances

EPA is not finalizing the proposal to establish the same evacuation requirements for servicing small appliances charged with HFC and PFC refrigerants as it has for small appliances charged with CFC and HCFC refrigerants. However, EPA is finalizing these evacuation requirements for SNAP-approved substitute refrigerants that contain a class I or class II ODS.

Technicians opening small appliances for service, maintenance, or repair are required to use equipment certified either under Appendices B or B1, or under Appendix C, Method for Testing Recovery Devices for Use with Small Appliances, to recover the refrigerant, and must pull a four-inch vacuum on the small appliance being evacuated.

Equipment certified under Appendix C must capture 90 percent of the refrigerant in the appliance if the compressor is operating, and 80 percent of the refrigerant if the compressor is not operating. Because the percentage of refrigerant mass recovered is very difficult to measure on any given job, technicians must adhere to the servicing procedure certified for that recovery system, under Appendix C, to ensure that they achieve the required recovery efficiencies.

c. Evacuation Levels for Disposal of MVACs, MVAC-like Appliances, and Small Appliances

EPA had proposed to establish the same evacuation requirements for disposal of small appliances, MVACs, and MVAC-like appliances that are charged with HFC refrigerants as it has for these types of appliances charged with CFC and HCFC

refrigerants.

EPA received comments generally supporting the evacuation requirements for disposal of small appliances, MVACs, and MVAC-like appliances, but one commenter argued that the responsibility for removing remaining refrigerants from appliances destined for disposal or for recycling should be placed on the person disposing of the appliance or delivering the appliance for recycling as opposed to the person recycling the obsolete appliance.

Sections 608(b)(1) and 608(c)(2) require that class I and class II refrigerants or their substitute refrigerants, that are contained in bulk in appliances be removed from the appliance prior to its disposal or delivery for recycling. The Agency does not interpret this statutory language to mean that scrap metal recyclers who choose to dispose of appliances or choose to accept appliances (or their parts) with refrigerant charges intact are exempt from the Required Practices codified at §82.156 (including the acquisition of recovery equipment that meets the standards set forth in §82.158). Therefore, persons who take the final step in the disposal process of small appliances, MVACs, and MVAC-like appliances must either recover any remaining refrigerant in the appliance or verify that the refrigerant has previously been recovered from the appliance or shipment of appliances.

EPA is not establishing the same evacuation requirements for disposal of small appliances, MVACs, and MVAC-like appliances that are charged with HFC refrigerants as it has for these types of appliances charged with CFC or HCFC refrigerants. However, EPA is finalizing these evacuation requirements for such appliances that use a substitute refrigerant consisting, in part, of a class I or class II substance (for example,

an HFC refrigerant blend that contains an HCFC). Such MVACs and MVAC-like appliances must be evacuated to 102 mm (approximately four inches) of mercury vacuum, and 80 or 90 percent of the refrigerant in small appliances must be recovered (depending on whether or not the compressor is operating) or the small appliance must be evacuated to four inches of mercury vacuum. Although EPA is not finalizing the proposed evacuation requirements, it remains illegal to knowingly vent HFC refrigerants during the service, maintenance, repair, or disposal of small, MVAC, and MVAC-like appliances.

d. Request for Comment on Establishing Special Evacuation Requirements for Heat Transfer Appliances

As noted in the NPRM, EPA received comments from a manufacturer of PFCs stating that special evacuation requirements may be appropriate for certain types of heat transfer appliances containing PFCs, such as some types of electrical transformers. The commenter specifically noted that evacuating some types of heat transfer systems may result in damage to those systems, that in many cases, parts to be repaired may be isolated from the refrigerant charge, and that many repairs may be performed quickly, releasing little refrigerant even if the system is not evacuated.

EPA received no comments in response to its request for comment on the need for special evacuation requirements for heat transfer appliances, and EPA is not establishing evacuation requirements for any appliance using pure PFCs.

e. Clarifications of Evacuation Requirements

In the NPRM, EPA proposed two clarifications to the evacuation requirements based on a previous request to the Agency. Specifically, the first request for

clarification concerned whether a part of the appliance that is not a separate tank may be considered a “system receiver,” in which the system charge may be isolated while another isolated part of the appliance is opened for repairs. The second request for clarification concerned whether an isolated portion of an appliance that already meets the required level of evacuation due to normal operating characteristics may be opened for repairs without further evacuation. In addition to minor changes to the regulatory language to respond to the first and second requests, EPA proposed to add language to paragraph §82.156(a) to clarify that, except in the case of non-major repairs to low-pressure appliances, liquid refrigerant must be removed from appliances (or from the isolated parts to be serviced) before they are opened to the atmosphere.

EPA received one comment suggesting the use of the term “storage vessel” in situations where the system receiver is used as a storage vessel and can be isolated from the rest of the system.

The required practices at §82.156 require that all persons opening appliances except for MVACs and MVAC-like appliances for maintenance, service, or repair evacuate the refrigerant, including all the liquid refrigerant in either the entire unit or the part to be serviced (if the latter can be isolated) to a system receiver (e.g., the remaining portions of the appliance, or a specific vessel within the appliance) or a recovery or recycling machine certified pursuant to §82.158. If the system receiver also serves as a storage vessel, then the required practice is satisfied.

As proposed, EPA is today clarifying that for purposes of complying with §82.156(a), EPA interprets the term “system receiver” to include a part of the appliance that is not a separate tank, if that portion of the appliance can be isolated from the

portion of the appliance that is opened for repairs. From an environmental perspective, EPA believes that the critical consideration is whether the part of the appliance to be opened to the atmosphere for repair has had the refrigerant removed and isolated from it, not the configuration of the remaining appliance parts within which the refrigerant is isolated. To clarify this point, EPA is amending paragraph §82.156(a) by adding the following examples after the term "system receiver": "(e.g., the remaining portions of the appliance, or a specific vessel within the appliance)."

In addition to clarifying its interpretation of "system receiver," as proposed, EPA is adding language to §82.156(a) to ensure that the regulations clearly preclude a possible misinterpretation of these requirements. EPA has always interpreted §82.156(a) to require that, except in the case of non-major repairs to low-pressure appliances, liquid refrigerant must be removed from appliances (or from the isolated parts to be serviced) before they are opened to the atmosphere. Currently, §82.156(a) reads (in part) "all persons disposing of appliances . . . must evacuate the refrigerant in the entire unit to a recovery/recycling machine certified pursuant to §82.158. All persons opening appliances . . . must evacuate the refrigerant in either the entire unit or the part to be serviced (if the latter can be isolated) to a system receiver or a recovery or recycling equipment certified pursuant to §82.158." Paragraphs 82.156(a)(1) through (5) specify pressures to which the appliances must be evacuated.

It has come to EPA's attention that it may be possible in some cases to briefly attain the required evacuation levels specified in paragraphs 82.156(a)(1) through (5) while there is still liquid refrigerant in the appliance or in the isolated part to be serviced. In general, if vapor is removed from a mixture of liquid and vapor refrigerant at

equilibrium, thus reducing the vapor pressure, the liquid will boil until the equilibrium between the vapor and liquid states is restored, returning the vapor pressure to the saturation pressure of the refrigerant. However, heat must flow into the system from the environment for this to occur, and such heat flow takes time. Thus, if an individual quickly recovers vapor from an appliance, permitting no time for the liquid to boil to return the vapor pressure to the equilibrium value, the pressure specified in §82.156(a) may be attained, albeit only temporarily. If the individual opens the appliance at this point, a great deal of refrigerant will be released to the environment. This is because the density of liquid refrigerant is typically one to two orders of magnitude greater than that of vapor refrigerant, meaning that a large mass of refrigerant may be concentrated in a relatively small volume of liquid, and the liquid will continue to boil off into the atmosphere as long as the appliance is opened.

EPA believes that the use of the phrase “evacuate the refrigerant” in §82.156(a), as well as the language in §82.154(a)(the prohibition on venting), already clearly indicates that liquid refrigerant must be removed from the appliance or isolated part before it is opened for servicing. Otherwise, a significant portion of the refrigerant will not be evacuated to a recovery device, a good faith effort to recover and recycle refrigerant will not be made, and releases to the environment would not be considered a de minimis release.

One commenter stated that it may not be possible to remove all liquid refrigerant as a part of the required evacuation prior to opening a refrigeration system. The commenter asserted that due to the complexity and uniqueness of some large refrigeration systems, it may be impossible to determine if all liquid refrigerant has been

removed from the entire system prior to opening. The commenter added that determination may become even more difficult for substitute refrigerants that remain in the liquid phase at or near ambient temperature and pressure.

The Agency continues to believe that these clarifications in §82.156(a) are appropriate as proposed. The intent of the wording change to the required practices is to make certain that refrigerant will be evacuated to a recovery device prior to opening an appliance. In order to eliminate any possible ambiguity on this point, the Agency is adding the phrase, “including all the liquid refrigerant,” after the phrase, “the refrigerant,” in both places where it occurs in §82.156(a). To ensure that the modified language does not implicitly override §82.156(a)(2)(i)(B), which provides that recovery of liquid is not required in cases of non-major repairs to low-pressure appliances, EPA is also adding the parenthetical phrase “(except as provided at §82.156(a)(2)(i)(B))” to the second occurrence of “including all liquid refrigerant.”

In response to the second request for clarification, EPA believes that if a part of an appliance already meets the required level of evacuation due to normal operating characteristics, it may be isolated and opened for service, maintenance, or repair without further evacuation, so long as liquid refrigerant is not present in the isolated part. Again, the purpose of the requirement to evacuate under §82.156(a) is to minimize refrigerant emissions from the part. If the required level of evacuation has been met, and no liquid is present in the isolated part, only de minimis quantities of refrigerant will be released when the part is opened to the atmosphere. Therefore, this situation meets the requirements to evacuate under §82.156(a).

The third point of clarification concerns verification of evacuation by certified

technicians. EPA received a comment requesting clarification concerning verification of evacuation requirements by certified technicians. A commenter stated that the reference to “technicians” should be singular not plural. EPA certainly believes that verification by a single technician is sufficient. Accordingly, section 82.156(a) is modified to state that a certified technician must verify that the applicable level of evacuation has been reached in the appliance or the part before it is opened.

2. Extension of the Refrigerant Standard to Substitute Refrigerants

In the NPRM, EPA proposed to establish refrigerant standards for new and used HFC and PFC refrigerants that were very similar to those for CFCs and HCFCs. In addition, the Agency proposed to update its requirements for all refrigerants to reflect the ARI Standard 700-1995, Specifications for Fluorocarbon and Other Refrigerants, which includes standards for a number of refrigerants that were not addressed by the previously codified standard, ARI Standard 700-1993. EPA also requested comment on adoption of a generic standard for those refrigerants that are not covered by ARI Standard 700-1995.

In a previous rulemaking (July 24, 2003; 68 FR 43786), commonly referred to as the IRG-2, EPA adopted, with modification, the ARI Standard 700-1995 along with the standard’s analytical protocol (i.e., Appendix C to ARI Standard 700-1995) into Appendix A of §82, subpart F. While the IRG-2 rulemaking adopted the ARI Standard 700-1995, it included a modification in that the rule did not adopt standards for refrigerants that were not included in the originally adopted ARI Standard 700-1993, namely HFC refrigerants and blends thereof.

a. Updates to the Refrigerant Standard

In the NPRM, EPA proposed to adopt ARI 700-1995, that includes standards for a number of refrigerants that were not addressed by the previously codified standard, ARI 700-1993. These refrigerants include R-404A, R-405A, R-406A, R-407A, B, and C, R-408A, R-409A, R-410A and B, R-411A and B, R-412A, R-507, R-508 and R-509. The proposed changes to the standard included: (1) the adoption of a single analysis (for each blend) for determining both the composition of each refrigerant blend and its level of contamination by organic impurities, and (2) the standardization of the wide range of equipment, techniques, and calculations used in the methods for determining the composition of refrigerant blends.

The NPRM also proposed changes to the referenced protocol in Section 5.1 Referee Test (63 FR 32095), which specifically references Appendix C to ARI Standard 700-95-Analytical Procedures for ARI Standard 700-95. In addition, the ARI Standard 700's analytical protocol was originally included into regulation by reference into Appendix A of §82, subpart F (based on ARI Standard 700-1993), as *Section 5. Sampling, Summary of Test Methods and Maximum Permissible Contaminant Levels* (May 14, 1993; 58 FR 28660). The protocol established definitive test procedures for determining the quality of new, reclaimed and/or repackaged refrigerants for use in new and existing refrigeration and air-conditioning equipment. Proposed changes to Appendix C to ARI Standard 700-95 included:

· The addition of test methods for determining the composition of the zeotropic refrigerant blend families R-404, R-407, R-408, R-409, and R-410, and of the azeotropic refrigerant blends R-507 and R-508 - These additions enable laboratories to verify that the blends contain the appropriate percentages of their

component materials.

- The addition of a gravimetric test as an alternate method for determining high-boiling residues. This method is considered to be more accurate than the previously adopted volumetric method. This addition permits laboratories with the appropriate facilities and expertise to perform more precise measurements of high-boiling residues than are permitted by the volumetric method. The volumetric method is retained as an alternate in ARI 700-95, because it is adequately precise for most applications, and is less expensive to perform than the gravimetric method.
- Finally, several typographic and wording changes were made to improve the clarity of the standard.

EPA believes that these changes will make the reclamation requirements more enforceable while decreasing the burden of industry to prove conformance.

EPA received several comments concerning the requirements for substitute HFC and PFC refrigerants. However, EPA is not finalizing refrigerant standards for HFC or PFC refrigerants that do not contain an ODS. Refrigerants that were previously adopted into Appendix A, based on ARI Standard 700-1993 that do not consist in part or whole of a listed class I or class II ozone-depleting chemicals will not be included in the new appendix, namely R-23; R-32; R-125; R-134a; and R-143a.

Today's action includes substitute refrigerants consisting of a class I or class II ODS into Appendix A (based on the ARI Standard 700-1995), that were omitted from the IRG-2 rulemaking (July 24, 2003; 68 FR 43786) because they were either pure HFC refrigerants or blends of HFC refrigerants. While ARI Standard 700-1995 includes

standards for a number of refrigerants that were not addressed by the previously codified standard, ARI Standard 700-1993, EPA is only adopting refrigerant standards for those substitute refrigerants listed in ARI Standard 700-1995 that consist in part or whole of an ODS, namely R-11; R-12; R-13; R-22; R-113; R-114; R-123; R-124; R-401A and B; R-402A and B; R-405A; R-406A; R-408A; R-409A; R-411A and B; R-412A; R-500; R-502; R-503; and R-509.

b. Generic Specification Standards for Refrigerants

Despite EPA's recent adoption of the ARI Standard 700-1995, the Agency's refrigerant standards are likely to be rendered incomplete by the rapid development and introduction of new refrigerants into the market. Although EPA will consider specification requirements along with recycling requirements for each new refrigerant as it undergoes SNAP review, there is likely to be a delay between the introduction of new refrigerants and SNAP approval of new refrigerants. EPA feels that it is premature to adopt specific specification standards for refrigerants prior to their acceptance for specific end-uses under SNAP. To address this issue, EPA proposed to establish a generic refrigerant standard for refrigerant substitutes for which standards have not yet been codified into Appendix A of 40 CFR 82, subpart F.

EPA received comment that the proposed generic specifications failed to include a specification for either organic impurities or for blend balance. EPA notes that specifications for organic impurities are included in the *"Other Impurities Including Refrigerant"* column and are limited to 0.50% by weight. EPA is establishing that the allowable blend composition of reclaimed refrigerant must be maintained to ±2.0% for blend components greater than or equal to 25%; ±1.0% for blend components less than

25% but greater than or equal to 10%; ±0.50% for blend components less than 10%. This means that for refrigerant blends that must meet the generic specifications, each blend component must be maintained at the aforementioned levels in order to be considered reclaimed. For example, assume that the hypothetical azeotropic blend R-500x has a nominal composition of a, b, and c at 8%, 13%, and 79% respectively, where any component consists of an ODS. The reclaimed blend R-500x must have a composition that falls within the following ranges: component a: 7.5% to 8.5%; component b: 12% to 14%; and component c: 77% to 81%.

EPA received favorable comments and requests to include the generic maximum contaminant level (based on ARI Standard 700-1995) for refrigerants that have SNAP approval but have not been included into ARI Standard 700. One commenter expressed concern that the ARI Standard 700 would act as regulation (instead of EPA adopting the standard as Appendix A), and possibly allow the use of refrigerants that have not been approved for specific end-uses under SNAP.

EPA is aware that instances may occur where refrigerants have been listed as approved for specific end-uses under SNAP, but have not been noted in the ARI Standard 700. Conversely, refrigerants may not have SNAP approval for a particular refrigeration end-use, but may be included in the ARI Standard 700. EPA has made efforts throughout this action to clarify that Appendix A to 40 CFR 82 subpart F is the Federal regulation that governs specifications for refrigerants. While this appendix is based on ARI Standard 700, the ARI standard is not in itself a regulation. This point is essential as EPA determines specifications for SNAP-approved refrigerants, so that mandatory specifications are not created for substitute refrigerants that have either

been found unacceptable for specific end-uses or have not been addressed under SNAP.

Reclamation requires not only that refrigerant be processed to the refrigerant specifications in Appendix A, but also that it be analyzed to verify that it meets the specifications. Therefore, a “generic refrigerant specification” should be matched by a generic analytical protocol. General analytical procedures exist to determine the levels of acidity, water, high-boiling residue, chloride, and noncondensable gases in refrigerants; these procedures are detailed in Parts 1 through 5 of Appendix C to ARI Standard 700-1995. However, individual gas chromatography procedures are required for each refrigerant in order to determine the overall purity of that refrigerant. This is because each refrigerant has its own gas chromatogram (profile) and characteristic impurities (other than acid, water, high-boiling residue, chloride, and noncondensable gases). EPA understands that the need to develop gas chromatography procedures is what frequently slows the adoption of reclamation procedures for new refrigerants. Thus, EPA believes that it is useful to have generic specifications for new refrigerants and analytical protocols for acid, water, high-boiling residues, chloride, and noncondensable gases for these refrigerants in the absence of specific gas chromatography procedures.

Thus, the proposed generic specifications are applicable for all SNAP-approved refrigerants, consisting in whole or in part of an ODS, for which specification standards have not yet been included in Appendix A. EPA is establishing and including as Appendix A1 the following generic maximum contaminant levels for refrigerants and specific composition standards for SNAP-approved refrigerant blends awaiting inclusion

into Appendix A:

Generic Maximum Contaminant Levels

Contaminant	Reporting Units
Air and Other Non-condensables	1.5% by volume @ 25°C (N/A for refrigerants used in low-pressure appliances*)
Water	10 ppm by weight 20 ppm by weight (for refrigerants used in low-pressure appliances*)
Other Impurities Including Refrigerant	0.50% by weight
High boiling residue	0.01% by volume
Particulates/solids	visually clean to pass
Acidity	1.0 ppm by weight
Chlorides (chloride level for pass/fail is 3ppm)	No visible turbidity

*low-pressure appliances means an appliance that uses a refrigerant with a liquid phase saturation pressure below 45 psia at 104 °F.

Blend Compositions (where applicable)	
Nominal Composition (by weight%)	Allowable Composition (by weight%)
component constitutes 25% or more	± 2.0%
component constitutes less than 25% but greater than 10%	± 1.0%
component constitutes less than or equal to 10%	± 0.5%

EPA also received comment that the process for reclaiming blended refrigerant back to original specifications at a reclamation facility is a technically simple operation, which is hampered by the refrigerant manufacturers' refusal to sell any amount of the individual blend components to a reclaimer not affiliated with the manufacturer. The manufacturers, however, argued that reclaimers who return fractionated refrigerants to specification would be guilty of patent infringement. The commenter believed that the patent in this case has already been served on the fractionated refrigerant and returning this refrigerant to specification constitutes repair of broken material. The commenter requested that part of the final rule include a requirement for refrigerant manufacturers to make components of refrigerant blends available to reclamation facilities at a fair

market price.

EPA declines to address these issues in this final rule. EPA did not propose to require refrigerant manufacturers to make components of refrigerant blends available to reclamation facilities. Therefore, EPA will not now impose such a requirement in this final rule. Moreover, EPA views this as, essentially, a commercial dispute that is not appropriately addressed in the context of EPA's regulations.

c. Application of the Refrigerant Standard to Virgin and Used Refrigerants

EPA believes that the vast majority of new refrigerant sold meets the ARI Standard 700-1995, and that chemical manufacturers have led the way in assuring that new refrigerants meet the specifications of the Standard. However, the Agency understands that used or contaminated refrigerant has been marketed and/or sold as "new," which could result in equipment failure and subsequent venting of ozone-depleting refrigerants. In order to ensure that the Agency can prevent the sale of contaminated refrigerant that is labeled as "new," EPA is clarifying that all refrigerants must meet the specifications of Appendix A, based on the ARI Standard 700-1995, regardless of how they are marketed. EPA received favorable comments on this requirement, which cited the need to have all refrigerants meet the refrigerant specifications regardless of origin.

Commenters stated that manufacturers of virgin refrigerants have previously established operating procedures to meet the refrigerant standard, and have consistently verified the results using the protocol established under ARI Standard 700. Therefore, EPA believes that this requirement will not place additional burden on the refrigerant manufacturing industry, since the industry would have continued to follow

ARI Standard 700 in the absence of this regulatory clarification.

d. Possession and Transfer of Used Refrigerant

The Agency received a comment from an EPA-certified refrigerant reclaimer requesting clarification as to what entities, other than reclaimers, can take possession of used product and what reporting is required of them once they take possession.

EPA regulations prohibit the sale of any used refrigerant, with the exceptions of refrigerant used and intended for use in MVAC or MVAC-like appliances, unless it has been reclaimed by an EPA-certified reclaimer (§82.154(g)). Therefore, it would be a violation of this prohibition for any person (including wholesalers, service companies, and brokers) to sell the material (i.e., used refrigerant) for use as a refrigerant to a new owner.

Since used refrigerant that is sold to an EPA-certified reclaimer does not equate to sale of used refrigerant to a new owner, such sale is legal. Therefore, EPA finds that persons such as wholesalers, service companies, and brokers are allowed to collect used refrigerant for the purpose of selling bulk quantities to certified reclaimers. This interpretation reduces emissions by granting flexibility to appliance owners who cannot afford the burden of storing small quantities of used refrigerant, while allowing other entities to transfer ownership of the used refrigerant to certified reclaimers. Without this flexibility, some appliance owners might have an incentive to vent refrigerant instead of bearing the costs of storing used refrigerant or shipping small quantities of refrigerant to reclaimers. This transfer of ownership is not deemed a violation of §82.154(g) since the material is not intended for use as a refrigerant, but as used material for purposes of reclamation. Conversely, it would be a violation of this section for any person to sell the

material as a refrigerant, unless it has first been reclaimed by an EPA-certified reclaimer.

3. Leak Repair

In the NPRM, EPA proposed to lower the permissible leak rates for some air-conditioning and refrigeration equipment containing more than 50 pounds of CFC or HCFC refrigerant, and to extend the leak repair requirements (as they would be amended) to air-conditioning and refrigeration equipment containing more than 50 pounds of HFC or PFC refrigerant. Specifically, EPA proposed to lower the permissible annual leak rate for new commercial refrigeration equipment from 35 to 10 percent of the charge per year, the permissible annual leak rate for older commercial refrigeration equipment from 35 to 15 percent per year; the permissible annual leak rate for some industrial process refrigeration equipment from 35 to 20 percent of the charge per year; the permissible annual leak rate for other new appliances (e.g., comfort cooling chillers) from 15 to 5 percent of the charge per year; and the permissible annual leak rate for other existing appliances (e.g., comfort cooling chillers) from 15 to 10 percent of the charge per year.

EPA has decided to defer action on the leak repair components of the NPRM to a future rulemaking dedicated to finalizing the proposed leak repair requirements.

4. Servicing MVAC and MVAC-like Appliances Containing Substitute Refrigerants

a. Background

MVAC-like appliances are open-drive compressor appliances used to cool the driver's or passenger's compartment of non-road motor vehicles, such as agricultural or

construction vehicles. MVAC-like appliances are essentially identical to motor vehicle air conditioners, which are subject to regulations promulgated under section 609 of the Act, but because MVAC-like appliances are contained in non-road vehicles, they are subject to regulations promulgated under section 608 of the Act.

Due to the similarities between MVACs and MVAC-like appliances in design and servicing patterns, EPA has established requirements regarding the servicing of MVAC-like appliances that are very similar to those for MVACs (58 FR 28686). In fact, many of the section 608 requirements for MVAC-like appliances that are published at subpart F simply refer to the section 609 requirements for MVACs that are published at subpart B. For instance, §82.156(a)(5) states that persons who open MVAC-like appliances for maintenance, service, or repair may do so only while "properly using," as defined at §82.32(e), recycling or recovery equipment certified pursuant to §82.158(f) or (g) as applicable. The definition of "properly using" appears in the regulations published at subpart B, and the reference therefore subjects MVAC-like appliances to the evacuation and refrigerant standard requirements of subpart B. Similarly, the equipment and technician certification provisions applicable to MVAC-like appliances in subpart F (§82.158(f) and §82.161(a)(5)) refer to the equipment and technician certification provisions applicable to MVACs in subpart B (§82.36(a) and §82.40).

The section 609 and 608 regulations treat MVACs and MVAC-like appliances (and persons servicing them) slightly differently in four areas. First, persons who service MVACs are subject to the section 609 equipment and technician certification requirements only if they perform "service for consideration," meaning that they are financially or otherwise compensated for their services. Persons who service MVAC-

like appliances are subject to the section 608 equipment and technician certification requirements regardless of whether they are compensated for their work[11]. Second, persons who service MVACs must have recovery and recycling equipment available at their place of business, even if they never open the refrigeration circuit of the MVACs. In contrast, persons who service MVAC-like appliances are required to have recovery and recycling equipment available at their place of business only if they open the appliances (i.e., perform work that would release refrigerant to the environment unless the refrigerant were recovered previously). Third, recycling and recovery equipment that is intended for use with MVACs and that was manufactured before the effective date of the section 609 equipment certification provisions must be demonstrated to be "substantially identical" to certified recycling equipment. While refrigerant recycling and recovery equipment manufactured before the effective date of the section 608 equipment and intended for use with MVAC-like appliances must be able to pull a 4-inch vacuum. Finally, persons servicing MVAC-like appliances have the option of becoming certified as Type II technicians under subpart F (i.e., section 608) instead of becoming certified as MVAC technicians under subpart B (i.e., section 609). The first three differences arise from differences between the statutory requirements of sections 608

[11] Note that persons servicing MVACs are subject to the section 608 venting prohibition regardless of whether they are compensated for their work.

and 609; the last is intended to give persons who service MVAC-like appliances flexibility in choosing the type of training and testing most appropriate for their work.

b. Amendments to Subpart B

In a final rule published on December 30, 1997 (62 FR 68025), EPA made several changes to the provisions governing servicing of MVACs and MVAC-like appliances (as they are currently defined) at subpart B. First, EPA extended the regulations to MVACs containing substitutes for CFC and HCFC refrigerants. Second, EPA explicitly allowed mobile servicing of MVACs and MVAC-like appliances. That is, technicians are permitted to transport their recovery/recycling equipment from their place of business in order to recover refrigerant from an MVAC or MVAC-like appliance before servicing it. Third, EPA permitted refrigerant recovered from disposed MVACs or MVAC-like appliances to be reused in MVACs or MVAC-like appliances without reclamation, as long as the refrigerant was processed through approved refrigerant recycling equipment before being charged into the MVAC to be serviced. Fourth, EPA adopted new standards for recycling and recovery equipment intended for use with MVACs. These new standards address HFC-134a recovery/recycling equipment, HFC-134a recover-only equipment, service procedures for HFC-134a containment, standards for recycled HFC-134a, recovery/recycling equipment intended for use with both CFC-12 and HFC-134a, and recover-only equipment designed to be used with any motor vehicle refrigerants other than CFC-12 and HFC-134a. Please refer to the December 30, 1997, final rule for a detailed explanation and justification of these changes for MVACs.

These regulations apply both to MVACs containing all SNAP-approved

substitutes and to MVAC-like appliances containing class I and class II substances. As discussed at length in the final amendment to subpart B, EPA believes that it is appropriate to cover both MVACs and MVAC-like appliances under the subpart B regulations, although EPA is relying on section 608 authority to address refrigerant venting during the maintenance, service, repair, and disposal of MVAC-like appliances. In brief, the rationale for this approach is that (1) MVACs and MVAC-like appliance are very similar, and the requirements for MVAC-like appliances under the subpart F regulations have historically referred back to the requirements for MVACs under subpart B, and (2) MVACs and MVAC-like appliances are often serviced by the same group of people, and therefore publishing the requirements for both MVACs and MVAC-like appliances in the same place will minimize confusion within this group. Under this approach, most of the provisions governing MVAC-like appliances have been reproduced in the regulations at subpart B and will be removed from the regulations at subpart F; an important exception is the definition of MVAC-like appliance, which will remain in the regulations at subpart F. Thus, the final subpart B rule covers MVAC-like appliances as defined in the subpart F regulations, which at the time of the final subpart B rule was promulgated, meant MVAC-like appliances containing CFCs or HCFCs. However, the subpart B amendment did not affect the four differences between the treatment of MVACs and MVAC-like appliances identified above.

c. Amendments Concerning MVAC and MVAC-like Appliances Containing Substitute Refrigerants

As proposed and discussed previously, EPA has changed the definitions of “appliance” and “opening” in subpart F to include substitute refrigerants. EPA is also

establishing required practices for “MVAC-like appliance” (which is based on the definition of “appliance”). This effectively applies the major requirements of the amended subpart B regulations to MVAC-like appliances containing substitutes for CFCs and HCFCs that consist of a class I or class II ODS. However today’s final rule does not affect the section 609 service requirements for MVACs using HFC-134a (R-134a). Today’s final rule does establish that the regulatory structure in place for class I and class II ODSs used as refrigerants in MVACs will only apply to substitutes consisting of a class I or class II ODS. EPA has also made editorial changes to eliminate redundancy between the subpart B and subpart F rules in their treatment of MVAC-like appliances.

EPA believes that in order to implement the venting prohibition, it is necessary to apply the major subpart B requirements (including the requirements to properly use recycling and recovery equipment and to certify recycling and recovery equipment and technicians) to MVAC-like appliances containing substitute refrigerants. In the case of MVAC-like appliances, the similarities in design and servicing patterns between MVACs and MVAC-like appliances make it appropriate to subject MVAC-like appliances to the required practices and certification programs established for MVACs in subpart B rather than to the required practices and certification programs established for stationary appliances in subpart F. As noted above, the argument for parallel coverage of MVACs and MVAC-like appliances was discussed at length in the May 14, 1993 rule (58 FR 28686).

d. Clarification of Applicability-Servicing of Buses Using HCFC-22

EPA has become aware of a growing misinterpretation of how the Agency

classifies buses using HCFC-22 refrigerant (R-22), and how technicians servicing buses using R-22 should be certified. The definition of MVAC-like appliance at §82.152 specifically states that appliances using R-22 are not covered under the definition of MVAC-like. Similarly, the definition of MVAC at §82.32 specifically states that it does not cover air-conditioning systems found on passenger buses using HCFC-22 refrigerant.

Section 82.152 defines high-pressure appliance as an appliance that uses a refrigerant with a liquid phase saturation pressure between 170 psia and 355 psia at 104 °F, including R-22. EPA has established under §82.161(a)(2) that technicians who maintain, service, or repair high-pressure appliances must be certified as a section 608 type II technician. Hence taking the definition of high-pressure appliance into consideration, EPA finds that technicians servicing buses using R-22 must be certified according to section 608 not 609. EPA inspections at transit facilities typically have found that technicians have credentials that allow the servicing of buses using R-12, as well as buses using R-22 (i.e., that are certified under section 609 and section 608 type II, respectively). But, EPA has received an increasing number of inquiries concerning this issue. Therefore, EPA is providing clarification in this final rule to assist the regulated community.

E. Refrigerant Recovery/Recycling Equipment Certification

In the NPRM, EPA proposed to require that equipment used to service appliances containing HFCs and PFCs be tested by an EPA-approved laboratory to the same standards as apply to equipment used to service appliances containing class I

and class II refrigerants. This proposal was based on the more recent ARI Standard 740-1998, which adopts more substitute refrigerants into the standard than the 1995 version.

EPA has decided to address the proposed certification of refrigerant recovery/recycling equipment intended for use with substitute refrigerants in a future action.

F. Technician Certification

In the NPRM, EPA proposed to extend the certification requirements for technicians who work with CFC and HCFC refrigerants to technicians who work with HFCs and PFCs. EPA also proposed to “grandfather” technicians who have been certified to work with CFCs and HCFCs by not requiring them to be retested in order to work with HFC or PFC appliances.

Commenters generally supported EPA’s decision to not require additional training and testing in order to work with and purchase HFC and PFC refrigerants, as opposed to any requirement to once again certify credentialed technicians. EPA received numerous comments from members of the MVAC service sector expressing the need for fairness and consistency in applying rule provisions to all potentially environmentally damaging refrigerants. Comments from air-conditioning and refrigeration contractors voiced the opinion that the imposition of less stringent recovery or certification requirements for HFC refrigerants could undermine compliance with recycling requirements for both HFC and ozone-depleting refrigerants by confusing technicians and encouraging a "cavalier" attitude toward refrigerant recovery. The majority of commenters believed that failure to impose a technician certification requirement on

persons working with HFCs and PFCs would lead to release and mixture of both ozone-depleting refrigerants and their substitutes.

Commenters contesting the certification requirement stated several reasons to justify their opposition. They believe that economics and the value of refrigerants promote recovery and recycling, not an EPA mandate to certify technicians. They also contested the Agency's belief that certification will reduce venting or cross-contamination by providing technicians with information about effective and efficient recycling. These commenters stated that the technician certification requirement does not address the intent of persons, certified or not, who are predetermined to knowingly vent refrigerant, because technicians have routinely vented R-12 despite being certified, and preferred the option of educating technicians at the point of purchase via instructions and warnings instead of mandating further certification requirements.

With today's action, EPA is not requiring certification of technicians who work exclusively with HFC and PFC refrigerants that do not consist of a class I or class II ODS. However the Agency is clarifying that certification is required in order to maintain, service, or repair appliances, as well as to dispose appliances (other than small appliances, MVACs, and MVAC-like appliances) containing a substitute consisting of a class I or class II ODS. As discussed below, technician certification will also be required in order to purchase substitute refrigerants that contain a class I or class II ODS.

EPA believes that this action is necessary to effectively implement and enforce both section 608(c) and section 608(a)(2) of the Act. As discussed above, section 608(c) prohibits the knowing release of substitute refrigerants during the service, maintenance, repair or disposal of appliances, except for de minimis releases

associated with “good faith attempts to recapture and recycle or safely dispose” of these refrigerants. It is reasonable to interpret “good faith attempts to recapture and recycle or safely dispose” as requiring that only certified technicians perform service, maintenance, repair, or disposal that could release ozone-depleting refrigerants and/or ozone-depleting substitute refrigerants. This interpretation is also consistent with EPA’s interpretation of the same statutory language as it applies to ozone-depleting refrigerants.

It is the Agency’s belief that persons who are not certified technicians are far more likely to intentionally or inadvertently release refrigerant contrary to the venting prohibition, and that consistent application of technician certification requirements is necessary to implement the section 608(a) directive to reduce releases and maximize recapture and recycling of class I and II refrigerants. Requiring certification of technicians who work with substitute refrigerants that consist of a class I or class II ODS is also necessary to comply with the section 608(a) requirements for EPA to promulgate regulations that reduce emissions of class I and II refrigerants to the lowest achievable levels and maximize recapture and recycling of such substances. In fact, due to the absence of a certification requirement and their consequent lack of adequate training, they might be unaware of the existence or scope of the restrictions. Thus, they might fail to recover refrigerants properly or may not recover them at all. Technician certification requirements for work with substitute refrigerants consisting of a class I or class II ODS will directly reduce emissions of substitutes containing an ODS and protect against refrigerant mixture and cross contamination, which otherwise would cause more substantial releases of class I and II refrigerants for the following reasons.

First, technician certification ensures that technicians are trained in refrigerant recovery requirements and techniques and are knowledgeable of EPA refrigerant handling practices. Before EPA adopted the technician certification requirements, technicians in many sectors were not recovering refrigerants at all, and technicians who did recover were not necessarily minimizing emissions as much as possible. Thus, many technicians lacked expertise that they would need to comply with the recycling and recovery provisions, and needed training to acquire that expertise. While some vocational schools and training programs addressed refrigerant recovery, participation in such programs was low. Given this situation, EPA was concerned that without a testing or training requirement, recovery and recycling would often not occur at all or would be performed improperly. This would lead not only to refrigerant release, but to refrigerant contamination, safety concerns, productivity losses, and equipment damage. EPA discussed at length the benefits of training and certification in the final rule published on May 14, 1993 (58 FR 28691-94) and in the Regulatory Impact Analysis (RIA) performed for that rule (6-34 through 6-39).

While EPA understands that a person who is unconcerned about the venting of refrigerant may illegally do so whether or not they are certified, the Agency believes that requiring technicians to demonstrate knowledge of standard practices and regulations via a technician certification requirement is the most effective means of reducing refrigerant emissions. There is a direct correlation between information exchange to technicians and the technician certification requirement. Agency approved technician certifying programs tend to offer training programs, directly linked to the section 608 exam, covering proper handling and recovery techniques. Information from the EPA

Ozone Hotline reflects the fact that technicians seeking certification often request information about programs that also offer combined course work and study materials. In addition, EPA mandates that section 608 certifying programs test technicians' proficiency and understanding of the environmental impacts of venting, refrigeration regulations, refrigerant leak detection, recovery techniques, safety, and safe disposal of refrigerants. Mandatory certification also enhances EPA's ability to enforce today's rule by providing another tool for use against intentional noncompliance (i.e., the Agency's ability to revoke the technician's certification).

Secondly, in addition to possessing training in refrigerant recovery, certified individuals are more likely than uncertified individuals to have access to recovery equipment because they will have a heightened awareness, as proven by their passing grade for the certification exam, of the requirement to recover refrigerant prior to opening an appliance. EPA requires that persons maintaining, servicing, repairing, or disposing of air-conditioning and refrigeration appliances certify to the appropriate EPA Regional Office that they have acquired (built, bought, or leased) recovery/recycling equipment.

While EPA believes that the value of refrigerant independently promotes recycling and reclamation, nonetheless, this incentive can be and often is overridden by ignorance and/or defiance of regulations via a lack of access or use of recycling/recovery equipment. The requirement for technician certification will enhance the effect of the economic incentive provided by the value of refrigerant by ensuring that persons working with refrigerant have the information and equipment necessary to reach that economic potential.

For the reasons cited above, EPA believes that it is necessary to clarify and extend the technician certification requirement in order to implement section 608(a), and that EPA has authority under this section to promulgate a technician certification requirement. Therefore, EPA is extending the certification requirements for technicians who work with CFC and HCFC appliances to technicians who work with appliances containing substitute refrigerants that consist whole or in part of a class I or class II ODS.

EPA is not requiring previously certified technicians who have been certified to work with CFC and HCFC appliances to undertake additional training or testing in order to service substitutes containing an ODS. This decision is based on EPA's understanding that techniques and requirements for recycling substitute refrigerants are very similar to those for CFCs and HCFCs. Differences, such as compatibility with different lubricants, have been highlighted by the recycling/reclamation equipment certification program, and are being reinforced by recycling and recovery equipment manufacturers. EPA believes that more recent information on proper handling of substitutes has been and will continue to be disseminated to previously certified technicians, refrigerant manufacturers and distributors, recovery equipment manufacturers, industry associations, and the trade press. Moreover, the requirements for handling substitutes adopted in this rule are in most cases identical to the requirements for handling CFC and HCFC refrigerants.

In addition to EPA's outreach efforts, the normal chain of information dissemination within the refrigeration and air-conditioning community should quickly alert certified technicians of EPA's adoption of new specific standards for substitute

refrigerants. Accordingly, technicians that are already certified will be knowledgeable about the requirements for recapture and recovery, the potential damages associated with improper mixture of refrigerants and the existence of comprehensive requirements for refrigerant handling. Thus, the benefits of any new certification requirement affecting previously certified technicians would probably be small and would likely be outweighed by the burden of such certification.

New technicians entering the field (i.e., technicians certified after the effective date of this final rule) will have to become certified in order to maintain, service, or repair appliances using CFC, HCFC, and substitute refrigerants consisting of a class I or class II ODS. As part of its next update of the technician certification question bank, EPA will include questions on handling such substitute refrigerants and potential environmental damages associated with the illegal release of substitute refrigerants.

G. Refrigerant Sales Restriction

1. Background

In accordance with the regulations promulgated under sections 608 and 609, only certified technicians may purchase CFC and HCFC refrigerants. Effective November 14, 1994, the sales restriction covers any class I or class II substance used as a refrigerant. Thus, the restriction covers ozone-depleting refrigerants contained in bulk containers (cans, cylinders, or drums) and pre-charged parts of split-systems.[12]

[12]Effective January 27, 1995, the restriction on sale of pre-charged split systems has been stayed while EPA reconsiders this provision of the sales restriction.

The restriction excludes refrigerant contained in appliances, such as household refrigerators, window air conditioners, and packaged air conditioners. In addition, the restriction does not apply to class I or class II substances that are not used as refrigerants in appliances, such as those used as solvents or sterilizing agents.

In a previous rulemaking (July 24, 2003; 68 FR 43786), EPA amended the refrigerant sales restriction by amending §82.154(m), and further restricted the sale or distribution or the offer for sale or distribution of class I and class II substances used as refrigerants that are suitable for use in MVACs, to technicians certified by a program approved under §82.40 and certified in accordance with §82.34 (i.e., section 609 certified technicians). In accordance with §82.34(b), this modification limits refrigerant purchases, by such section 609 technicians, to R-12 and substitute refrigerants containing a class I or class II ODS that is listed as acceptable for use in MVACs, in accordance with all regulations promulgated under section 612 of the Act. Furthermore, only technicians certified under section 609 are allowed to purchase such ozone-depleting refrigerants in containers containing less than 20 pounds of such refrigerant, in accordance with §82.34(b).

Employers of certified technicians, or the employers' authorized representatives are also allowed to purchase refrigerant without being certified themselves. This provision of the sales restriction is allowed only if the employer provides the wholesaler with evidence that he or she employs at least one certified technician. The term "employers" includes, but is not limited to, appliance owners or operators who have a contract with a certified technician or employ service personnel to perform installation or service and manufacturers of air-conditioning and refrigeration equipment.

2. Extension of the Refrigerant Sales Restriction to Substitute Refrigerants

EPA proposed to extend the refrigerant sales restriction to HFC and PFC refrigerants in all size containers for use in all types of appliances, including HFC refrigerants suitable for use in MVACs. This effort was proposed to address the issue of venting of refrigerants from MVACs and more specifically the venting of refrigerants resulting from cross contamination as a result of retrofitting MVAC from R-12 to R-134a. While R-134a is an HFC refrigerant that does not contribute to stratospheric ozone depletion, it dominates the MVAC market for original manufactured equipment and retrofitted R-12 motor vehicles.

EPA received comments both opposed and in favor of such a restriction, specifically as it would apply to the sale of R-134a. EPA received comments from the aftermarket automotive parts industry stating that cross contamination is not a concern for MVACs using R-134a, and thus a sales restriction would not have an effect on venting reduction in the automobile sector. The commenters stated that the Agency's assumption that DIYers are likely to damage their MVACs by cross-contamination is invalid. The commenters in opposition to the sales restriction also described any attempt to reduce cross contamination via a sales restriction on R-134a as "too late," since the majority of R-12 vehicles have already been retrofitted.

During the comment period for this rule EPA received approximately 90 comments from automobile service representatives stating their assertion that the unrestricted sale of R-134a contributes to the problem of cross contamination of motor vehicle air-conditioning refrigeration systems by untrained individuals. The commenters claimed that DIYer retrofits of existing R-12 and R-134a systems are often conducted

improperly, leading to contamination of entire systems which causes the repair industry to suffer from this contamination long after the repair of the improper retrofit is complete. The commenters also stated that the automotive service industry has invested in training and equipment to prevent the venting of refrigerant and that those same efforts should be undertaken by anyone who handles refrigerant in the course of serving or repairing a motor vehicle air conditioner.

Commenters in opposition to the proposed sales restriction stated that the sales restriction provides an unfair economic benefit to the automotive refrigerant servicing industry by compelling all MVAC service to be performed in automotive repair shops. They noted that all persons who might be expected to release refrigerant in the course of maintaining, servicing, or disposing of appliances should invest in recovery and recycling equipment. Comments from MVAC service technicians claimed that many shops repair damage to MVACs caused as a result of improper retrofits where class I refrigerants have already been vented to the atmosphere. Commenters pointed out that repair shops invest in recovery and recycling machines that the general public cannot access.

In today's action, EPA is not finalizing the proposed restriction on the sale of HFC or PFC refrigerants to certified technicians. EPA believes that an extended sales restriction enforces the technician certification requirements of both the refrigerant recycling regulations promulgated under section 608 and those promulgated under section 609 and ultimately implement the requirements of sections 608(a) and 608(c)(2). As discussed below, EPA has determined that the environmental benefit is not sufficient to mandate such a sales restriction for HFC and PFC refrigerants.

However, the Agency is extending the sales restriction to those substitutes that contain a class I or class II substance. This will restrict the sale of most HFC refrigerant blends to certified technicians.

EPA has decided that a more expansive sales restriction on HFC and PFC refrigerants would not have the desired impact of reducing class I and class II refrigerant emissions for a number of reasons. First, appliances used in the stationary sector use an array of class I, class II, and substitute refrigerants. Although R-410A appears to be the current substitute of choice in the stationary air-conditioning sector, HCFC refrigerants currently dominate the stationary market and will continue to do so in the foreseeable future. Therefore, the overwhelming majority of stationary technicians will not work solely on appliances using HFC or PFC refrigerants. Secondly, for the stationary sector the sales of class I or II refrigerants are already restricted to certified technicians and these technicians must be certified in order to work on appliances containing CFC and HCFC refrigerants.

Similarly, mobile sector technicians certified under section 609 of the Act who repair or service MVACs for consideration are already required to be certified by an EPA-approved organization (§82.34(a)). The sale of class I or II ODS refrigerants suitable for use in an MVAC in a container containing less than 20 pounds of refrigerant is restricted under section 609 (§82.34(b)) to 609 certified technicians and the sales of class I or II refrigerants in other size containers is restricted to section 608 certified technicians (§82.154(m)). Therefore, the effect of the technician certification and sales restriction on the mobile sector is identical to the effect of the proposed certification and extended sales restriction. That effect is the achievement of an overall reduction in the

emissions of refrigerants by ensuring that technicians are aware of the environmental consequences of illegal venting, refrigeration regulations, and proper use of recovery/recycling equipment.

In the absence of a requirement for all persons who open appliances to obtain and properly use EPA-certified recovery/recycling equipment, there is no means to ensure compliance with the venting prohibition. The remaining population affected by this rulemaking consists of the MVAC do-it-yourself (DIY) market. This category consists of automobile owners who choose to service their own MVACs and are not servicing or repairing MVACs for consideration. The sales of class I or II refrigerants to this group are limited to those DIYers who have been certified under section 609. While an extended sales restriction would limit the amount of illegal venting of refrigerants by persons who are not maintaining, servicing, or repairing MVACs for compensation (for example DIYers) by limiting the number of people legally able to purchase refrigerant, it would not address the issue of access to certified refrigerant recycle/recovery equipment. Although it is illegal to knowingly vent refrigerants, DIYers are the only segment of the regulated community for which EPA regulations do not explicitly require the proper use of certified recycle/recovery equipment. EPA believes that any effort to open an appliance prior to recovering the refrigerant would constitute a violation of the venting prohibition, and the only means for the DIYer to be in compliance with the venting prohibition is by using recovery equipment as a means of preventing venting during service, maintenance, and repair.

3. Consideration of Alternative Methods of Emissions Reduction

As discussed in the proposal, EPA considered and sought public comments on a

number of alternatives to an extended sales restriction on HFC and PFC refrigerants. EPA considered many alternatives to address the problem of cross contamination of refrigerants in the mobile air-conditioning sector which leads to the venting of class I or class II refrigerants. This venting occurs due to appliance or recovery/recycling equipment failure that results from contamination and refrigerant compatibility conflicts and the financial disincentive to destroy severely contaminated refrigerants that have been recovered from MVACs. Cross contamination is of particular interest in the MVAC service sector where mixtures of R-12 and R-134a, and to a lesser degree the illegal use of hydrocarbon refrigerants as a substitute for R-12, have become commonplace and the use of refrigerant identifiers and recovery equipment specified for use with unknown refrigerants has become common.

a. Unique Fittings

In the NPRM, EPA proposed as one alternative method for preventing mixture of ozone-depleting and HFC refrigerants a requirement that both HFC containers and HFC appliances be equipped with unique fittings that would prevent them from being connected to CFC or HCFC containers and appliances. Under SNAP, substitute refrigerant containers sold for use in the automotive market are required to be equipped with such fittings.

Several commenters stated that the requirement for unique fittings in the automotive sector is sufficient to reduce the emissions of ozone-depleting refrigerants. Thus, an extended sales restriction would not be necessary. Commenters pointed out that the adoption of unique fittings on containers and compressors by industry has greatly reduced cross-contamination, and there is no practical reason that precludes the

design of fitting for refrigerants in the stationary sector.

EPA has not overlooked the benefits of unique fitting or their effectiveness in reducing cross-contamination, but the Agency feels that implementing unique fittings into the stationary sector would be impractical and would not necessarily reduce the venting of the CFC or HCFC to be replaced. EPA believes that introducing a unique fittings requirement into the vast array of stationary sector appliances and refrigerant containers would be impractical for several reasons. The most fundamental reason is that the wide array of substitute refrigerants available for stationary equipment makes the development of a unique fitting for each one almost impossible. At least 25 refrigerants are currently being used in the stationary air-conditioning and refrigeration sectors, and more are being developed. Unique fittings are designed by choosing the diameter, turning direction, thread pitch (threads/inch) and shape of threads (normal vs. square, also known as Acme). However, fittings with the same diameter and turning direction can nearly always be connected using a wrench, regardless of thread pitch or shape. Therefore, the number of different fittings is limited to double the number of different diameters, since each diameter yields both a clockwise and a counterclockwise fitting. The number of diameters is itself limited because fittings must differ by at least 0.063 inches in diameter to ensure they will not cross-connect, and the range of

diameters is limited by valve core and surrounding space restrictions.[13] Thus, the number of unique fittings that can be developed is limited.

Moreover, even if unique fittings could be found for each of the refrigerants used in the stationary sectors, the logistics of implementing them would be formidable. To begin with, a massive program would be required to retrofit existing stationary appliances and recovery equipment with all of the unique fittings. Retrofits would presumably be required not only for all stationary appliances that have been retrofitted to substitute refrigerants, but for all of the equipment that uses one of the four traditional medium- to high-pressure refrigerants (i.e., R-12, R-22, R-502, and R-500). Otherwise, technicians who became accustomed to relying on fittings to distinguish among refrigerants might cross-contaminate these refrigerants as well.

In addition, the large number of fittings in the stationary sectors would make their use as a control on contamination unwieldy. A single piece of recovery equipment intended for use with medium-pressure refrigerants might conceivably require more

[13] In the MVAC market (to date), valve core and surrounding space restrictions have resulted in fittings ranging in diameter from 0.3 inches to 0.625 inches.

than 20 fittings. Given the similar exterior appearances of the fittings, finding the one that matched a particular appliance would be difficult. More important, this matching of fittings with appliances is not necessary if the recovery equipment has been properly cleared before use with a new refrigerant. Technicians who work on stationary air-conditioning and refrigeration equipment have long worked with multiple refrigerants, and recovery/recycling equipment that has been designed for use with multiple refrigerants. Instead of engineering controls, the stationary sector has relied on training in refrigerant charging and recovery to prevent cross-contamination. Adopting unique fittings in these sectors would represent a fundamental change of approach that would be unwieldy.

b. Limited Sales Restriction

In the NPRM, EPA proposed a more limited sales restriction as a means to address the concerns of illegal venting of ozone-depleting refrigerants. The limited sales restriction would restrict to certified technicians the sale of containers of substitute refrigerants that lack specialized fittings, but would permit the sale of containers of substitute refrigerants that contain such fittings to the general public. In this manner, DIY consumers and uncertified individuals would have unlimited access only to containers with fittings, making mixture and cross contamination more difficult.

EPA did not receive comments on the potential effectiveness and enforceability of such a limited sales restriction, but the overwhelming majority of commenters representing MVAC service shops recognized that a limited sales restriction would reduce the occurrences of illegal and uncontrolled venting of regulated refrigerants by limiting the supply of the refrigerant. These commenters supported the sales restriction

and argued that if people do not have the proper recovery/recycling equipment, they should not be allowed to purchase and use HFC and PFC refrigerants.

EPA believes that a limited sales restriction reduces the opportunity for noncompliance with the venting prohibition. A limited sales restriction reduces the quantity of refrigerant available to persons who are not performing service or repair on MVACs for consideration. However, even a limited sales restriction does not address the need for persons opening MVACs to properly use recovery equipment. Hence, EPA is not finalizing a limited sales restriction, but is emphasizing that the use of refrigerant recovery equipment by any person opening an appliance, including DIYers, is a necessity in order to prevent venting of refrigerant during service, maintenance, repair, and disposal of appliances.

c. MVAC Retrofit Kits

EPA received comments questioning why the Agency has allowed the unrestricted sale of MVAC R-12/R-134a retrofit kits. While the sale of R-12 is restricted to certified technicians, retrofit kits allow any person certified or not to replace the R-12 in an MVAC with R-134a.

EPA did not propose any restrictions on the sale of R-12/R-134a MVAC retrofit kits. However, EPA believes that retrofit kits could be linked to the venting of ozone-depleting refrigerants, particularly when any remaining R-12 in the MVAC is not recovered prior to opening the appliance. In the absence of the proper use of recovery equipment, the user would have no alternative other than to knowingly vent any remaining refrigerant charge in violation of section 608(c)(1). It is the Agency's interpretation that the use of such kits without properly recovering any remaining

refrigerant to be a violation of the venting prohibition. While EPA is not extending the sales restriction to people servicing appliances using HFC or PFC refrigerants, at a future date the Agency may consider a proposal, amending §82.34(a), requiring all persons repairing or servicing MVACs to use certified recovery equipment. Similarly, EPA could propose restrictions on the sale and use of R-12 retrofit kits.

H. Safe Disposal of Small Appliances, MVACs, and MVAC-like Appliances

1. Coverage of HFCs and PFCs

In the NPRM, EPA proposed and requested comment on its plan to adopt the same approach to the disposal of small appliances, MVACs and MVAC-like appliances charged with HFC and PFC refrigerants that it adopted for these types of equipment charged with CFC and HCFC refrigerants.

Commenters tended to agree with the Agency's decision to extend the safe disposal requirements for small appliances, MVACs, and MVAC-like appliances that contain substitutes for CFC and HCFC refrigerants, noting that it is important to reevaluate §608 requirements in connection with new or other alternative uses of refrigerant substitutes. When refrigerant is recovered from disposed small appliances, MVAC or MVAC-like appliances, and for the case of MVAC and MVAC-like appliances is not reused in similar appliances, the safe disposal and reclamation requirements set forth in the subpart F regulations apply.

EPA received comment from the Institute of Scrap Recycling Industries, Inc. (ISRI) requesting Agency clarification for safe disposal of small appliances, MVACs and MVAC-like appliances by distinguishing between recycling and disposal. ISRI argued that the responsibility for removing remaining refrigerants from appliances destined for

disposal or for recycling should be placed on the person disposing of the appliance or delivering the appliance for recycling and not upon the recycler of the obsolete appliance.

Section 608(b)(1) and 608(c)(2) require that class I, class II, and their substitute refrigerants contained in bulk in appliances be removed from the appliance prior to the disposal or their delivery for recycling. EPA's regulations at §82.156(f) require that persons taking the final step in the disposal process must either (1) recover any remaining refrigerant from the appliance, in accordance with regulatory requirements, or, (2) verify that the refrigerant has been evacuated from the appliance previously. If the final person in the disposal chain chooses to verify that the refrigerant has been recovered previously, they must retain a signed statement attesting to this in accordance with §82.166(i).

The rationale for establishing the safe disposal requirements for small appliances, MVACs, and MVAC-like appliances that contain CFCs and HCFCs was discussed at length in the May 14, 1993 rule (58 FR 28701). These requirements are designed to ensure that refrigerant is recovered before the appliance is finally disposed of while granting as much flexibility as possible to the disposal facility regarding the manner of its recovery. EPA considered such flexibility important for the disposal sector, which is highly diverse and decentralized.

EPA is not extending the established requirements for the safe disposal of appliances that enter the waste stream with the charge intact, including small appliances, MVACs, and MVAC-like appliances using class I and class II refrigerants to those appliances containing pure HFC and PFC refrigerants. However, EPA is

extending the safe disposal requirements to those substitutes containing an ODS. Therefore, persons who take the final step in disposing of small appliances, MVAC, and MVAC-like appliances that contain a class I or class II substance as a refrigerant must either: 1)recover any remaining refrigerant in the appliance; or 2)verify that the refrigerant has previously been recovered from the appliance or shipment of appliances, in accordance with the required practices of §82.156(f)(1) and (2). Recovery equipment used during the disposal of appliances, except small, MVAC, or MVAC-like appliances, must meet the same certification requirements as equipment used in the service, repair, and maintenance of appliances in accordance with §82.158(b) and (c).[14] In addition, persons recovering refrigerant during disposal of small, MVAC, or MVAC-like appliances need to do so in accordance with §82.156(f)-(h), but they need not be certified as section 608 technicians**.** These exemptions only apply to the disposal of small, MVAC, and MVAC-like appliances.

2. Transfer of Substitute Refrigerants During the Safe Disposal of MVAC and MVAC-

[14]Equipment used during the disposal of small, MVAC, or MVAC-like appliances need not be certified in accordance with §82.158(b) or (c).

like Appliances

In the December 30, 1997 amendments to the subpart B MVAC recycling regulation (62 FR 68025), EPA explicitly permitted refrigerant recovered from MVACs and MVAC-like appliances at disposal facilities to be reused in MVACs and MVAC-like appliances without being reclaimed. The transfer of such used refrigerant is allowed as long as certain other requirements are met. These requirements, which now also apply to any substitute consisting of a class I or class II ODS, including many HFC blends, deemed acceptable as substitutes for MVAC and MVAC-like appliances under SNAP, include the following: only section 609-certified technicians or disposal facility owners or operators may recover the refrigerant; the refrigerant recovered from the MVACs and MVAC-like appliances may not be mixed with refrigerant from any other sources; only section 609-certified recovery equipment may be used to recover the refrigerant; the refrigerant may be reused only in an MVAC or MVAC-like appliance; the refrigerant may be sold only to section 609-certified technicians; and section 609-certified technicians must recycle the refrigerant in section 609-certified recycling equipment before charging it into the MVAC or MVAC-like appliance. As discussed in the amendments to the section 609 rule, these restrictions are intended to ensure that the exemption from the reclamation requirement for refrigerant removed from and charged into MVACs and MVAC-like appliances does not compromise the purity of refrigerant flowing into the MVAC and MVAC-like appliance service sectors.

Most of these restrictions are authorized by section 609, which requires persons servicing motor vehicles for consideration to properly use approved refrigerant recycling equipment and to be properly trained and certified. The statutory definitions of “properly

use," "approved equipment," and "properly trained and certified" all reference Society of Automotive Engineers (SAE) standards that include purity requirements for refrigerant used to service MVACs.

These requirements for reuse of refrigerant, including substitutes consisting of a class I or class II ODS, from MVACs and MVAC-like appliances at disposal facilities apply in addition to the basic safe disposal requirements of the subpart F regulations under section 608, particularly the requirement that disposers recover the refrigerant (or ensure that the refrigerant is recovered by others) from the MVAC or MVAC-like appliance before the final step in the disposal process. Disposal facilities must also continue to observe the requirement that they retain signed statements attesting to the removal of the refrigerant from the MVAC or MVAC-like appliance, as applicable.

3. Clarification of Requirements for Persons Disposing of Appliances

In the NPRM, EPA requested comment on two possible textual changes to clarify the safe disposal provisions, which are contained in paragraph 82.156(f). EPA interprets the safe disposal provisions (as stated in Applicability Determination number 59) to apply to "the entity which conducted the process where the refrigerant was released if not properly recovered." EPA proposed to clarify that 82.156(f) applies to any person who performs disposal related activities, such as dismantling, recycling, or destroying the appliance, where the refrigerant would be released into the atmosphere if not properly recovered prior to violating the refrigerant circuit of the appliance.

The first modification amends the definition of "opening" found at §82.152 to include "the disposal of appliances." The first sentence of the revised definition of "opening" reads, "*Opening an appliance means any service, maintenance, repair, or*

disposal of an appliance that would release refrigerant from the appliance to the atmosphere unless the refrigerant were recovered previously from the appliance." The rest of the definition remains unchanged. In the NPRM, EPA had proposed a modification that would have added the phrase "persons who open the appliances in the course of disposing of them" to the introductory text of paragraph 82.156(f). EPA has opted to not add the phrase as proposed but modify §82.156(f) by providing examples of persons who might take the final step in the disposal process.

EPA received one comment opposing the proposed clarifications. The commenter expressed concern that the clarifications do not distinguish between recycling and disposal of appliances and could lead to recyclers facing the same requirements as those disposing of appliances or those delivering the appliances for recycling.

EPA is finalizing the two modifications to clarify that 82.156(f) applies to any person who performs disposal related activities, such as dismantling, recycling, or destroying the appliance, where the refrigerant would be released into the atmosphere if not properly recovered prior to violating the refrigerant circuit of the appliance. These clarifications do not place additional requirements on scrap recyclers. The context of the required practices of §82.156(f) has not been changed, as since promulgation of the section 608 regulations, the required practices for safe disposal of appliances have applied to persons who take the final step in the disposal process (as disposal is defined at §82.152[15]). In addition, the Act does not grant scrap recyclers an exemption

[15] Disposal, as defined in §82.152, means the process leading to and including: (1)

to the venting prohibitions. Sections 608 (b)(1) and (b)(2) require that class I and class II refrigerants as well as their substitutes contained in bulk in appliances be removed from the appliance prior to the disposal or their delivery for recycling. The Agency does not interpret this statutory language to mean that scrap recyclers who choose to dispose of appliances or choose to accept appliances (or their parts) with refrigerant charges intact are exempt from the required practices codified at §82.156 (including the acquisition of recovery equipment that meets the standards set forth in §82.158).

Persons who take the final step in the disposal process (including but not limited

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The discharge, deposit, dumping or placing of any discarded appliance into or on any land or water; (2) The disassembly of any appliance for discharge, deposit, dumping or placing of its discarded component parts into or on any land or water; or (3) The disassembly of any appliance for reuse of its component parts.

to scrap recyclers and landfill operators) must recover any remaining refrigerant from the appliance or verify that the refrigerant has been previously evacuated from the appliance. This required practice is applicable to persons preparing to reuse the component parts of an appliance, if the preparation could result in the release of any refrigerant consisting in whole or in part of a class I or class II ODS.

4. Stickers as a Form of Verification

EPA has become aware that there is confusion in the metal scrap and recycling industry concerning the safe disposal requirements. Especially as they pertain to the use of stickers as a means of verification of refrigerant recovery. Many final disposers will not accept small appliances, MVAC, or MVAC-like appliances unless a sticker is affixed to each appliance.

EPA has never mandated such stickers, and the Agency emphasizes that they may not satisfy the verification requirements of §82.156(f)(2). In order to satisfy the safe disposal requirements, such stickers, tags, or other identifying marks must include a signed statement from the person from whom the appliance is obtained that all refrigerant that had not leaked previously has been recovered from the appliance in accordance with paragraph §82.156(g) or (h), as applicable. The signed statement, even if presented in the form of a sticker or tag, must include the name and address of the person who recovered the refrigerant, and the date that the refrigerant was recovered.

I. Certification by Owners of Recycling or Recovery Equipment

EPA requires persons who maintain, service, repair, or dispose of appliances containing a refrigerant consisting of a class I or class II ODS to submit a signed

statement to the appropriate EPA Regional office stating that they possess refrigerant recovery/recycling equipment and are complying with the applicable requirements of the rule. In the NPRM, EPA proposed to extend these provisions to persons who maintain, service, repair, or dispose of appliances containing HFCs or PFCs, by revising the regulatory text of §82.162(a). EPA also proposed that persons who had already submitted such a signed statement for work on appliances containing CFCs or HCFCs would not need to submit a new statement for work on HFCs or PFCs. Therefore, only businesses coming into existence 60 days after the date of publication of this action would have been affected by the proposed provision.

EPA received no comments in opposition to the extension of the certification requirement to persons who maintain, service, repair, or dispose of appliances containing HFCs or PFCs. However, EPA is not finalizing the proposal to extend the certification requirement to those who maintain, service, repair, or dispose of appliances containing HFC or PFC refrigerants. EPA is extending these provisions to those who maintain, service, repair, or dispose of appliances containing substitutes that contain a class I or class II ODS.

While EPA is not finalizing certification requirements for refrigerant recovery/recycling equipment intended for use with HFC and PFC refrigerants, the Agency is aware that industry standards currently exist for certification of HFC recovery/recycling equipment. EPA supports the industry's efforts to certify and promote the use of refrigerant recovery/recycling equipment intended for use with SNAP-approved substitute refrigerants.

J. Servicing Apertures and Process Stubs

EPA prohibits the sale or distribution of CFC and HCFC appliances that are not equipped either with a process stub (in the case of small appliances) or with a servicing aperture (in the case of all other appliances) to facilitate refrigerant recovery. In the NPRM, EPA had proposed to extend this prohibition to the sale and distribution of appliances containing HFCs or PFCs. With today's action, EPA is finalizing the proposed requirement and is prohibiting the sale or distribution of any appliance containing an HFC, PFC, or substitute refrigerant consisting in whole or in part of a class I or class II ODS that is not equipped either with a process stub (in the case of small appliances) or with a servicing aperture (in the case of all other appliances) to facilitate refrigerant recovery.

EPA received a comment stating that the Act only prohibits "knowingly venting" a substitute refrigerant when servicing, maintaining, or disposing of a refrigeration appliance, but does not require new appliances to have servicing apertures or similar design features.

The rationale for requiring servicing apertures or process stubs on appliances containing a substitute refrigerant is the same as that for requiring these design features on CFC and HCFC appliances. Specifically, these features permit technicians to comply with the venting prohibition by making it much easier for them to attach recovery equipment to the refrigerant circuit and thereby recover the refrigerant properly. In the absence of an aperture or process stub requirement, there would not be a means of recovering refrigerant from appliances without suffering large refrigerant losses, and there would not be an easy means for those maintaining, servicing, repairing, or disposing of appliances to stay in compliance with the venting prohibition.

EPA is finalizing the aperture/process stub requirement for HFC and PFC appliances in order to complement industry efforts to properly recover them. EPA is aware that such industry standards have existed for several years and many manufacturers of recovery/recycling equipment have already marketed and distributed equipment certified to the industry standard. EPA hopes that such equipment will continue to be manufactured and is implementing the aperture requirement to facilitate recovery of HFC and PFC refrigerants.

K. Prohibition on the Manufacture or Import of One-Time Expansion Devices that Contain Other than Exempted Refrigerants

In the NPRM, EPA proposed a prohibition on the manufacture or import of one-time expansion devices that contain other refrigerants than EPA has exempted from the venting prohibition because their release does not pose a threat to the environment.

On March 3, 1999, EPA published a final rule (64 FR 10373) under SNAP finding that self-chilling cans using R-134a or R-152a are unacceptable substitutes (new or retrofit) for R-12, R-502, and R-22 in the following end-uses: household refrigeration, transport refrigeration, vending machines, cold storage warehouses, and retail food refrigeration. EPA believes that a prohibition on manufacturing or importing one-time expansion devices (which include self-chilling cans) is simultaneously the least burdensome and the most effective, efficient, and equitable way of carrying out the venting prohibition as it applies to them, and has created §82.154(o) accordingly.

EPA believes that section 608(c)(2) implicitly provides the Agency authority to promulgate regulations as necessary to implement and enforce the statutory prohibition, and section 301(a)(1)(a) further supplements that authority. EPA believes that a ban on

manufacture and import of the devices is the only practical way to implement the prohibition on venting of section 608(c)(2) of the Act and hence is necessary to implement and enforce that prohibition. The following provides EPA's rationale.

First, the prohibition on manufacturing or importing the devices is not too burdensome. One-time expansion devices function only by venting; hence, one-time expansion devices containing other than exempted refrigerants therefore have no legal use, given the self-effectuating venting prohibition of 608(c)(2). Thus, a prohibition on manufacture and import would not interfere with any lawful use of the device or can. At the same time, any burden on potential manufacturers of the can would not exist, because perfect implementation of the venting prohibition would prevent the manufacture of the cans. Thus, any burden placed on the manufacturer by a ban on manufacturing should be discounted.

Second, prohibiting the manufacture or import of cans containing other than exempted refrigerants is both more effective and more efficient than attempting to prevent the use of such cans by millions of potential consumers. EPA estimates that the total market for canned beverages in the U.S. is 100 billion units per year. Thus, if self-chilling cans captured even a small percentage of this market, very large numbers of cans could be used. For instance, if self-chilling cans captured just 1 percent of the canned beverage market, one billion self-chilling cans per year could be used, potentially violating the venting prohibition one billion times. Potential consumers of the can would include virtually the entire U.S. population. Without a ban on manufacture, the huge number of potential violators and violations would make the venting prohibition extremely difficult to enforce. A massive outreach campaign would be required to

inform the public of the environmental and legal implications of using the cans, and such a campaign would still miss some fraction of the population. At the same time, enforcement would be very difficult due to the large numbers of potential violations. In contrast, outreach to and enforcement against potential manufacturers of the can would only have to reach a few targets, interdicting the cans at the top of the distribution pyramid.

Thus, a ban on manufacture and import of cans containing other than exempted refrigerants is the only practical way to implement the venting prohibition as it applies to them. Moreover, there are a number of precedents for prohibiting the manufacture, sale, and/or distribution of appliances, other equipment, and refrigerants under section 608 in order to reduce refrigerant emissions. Sections 82.154(j) and (k) prohibit the sale or distribution of appliances unless they possess servicing apertures or process stubs, and §82.154(c) prohibits the manufacture or import of recycling or recovery equipment that is not certified. Section 82.154(g) prohibits the sale of used ozone-depleting refrigerants that have not been reclaimed (with minor exceptions), and §82.154(m) prohibits the sale of ozone-depleting refrigerants to uncertified individuals (again with minor exceptions). Sales restrictions were more appropriate than manufacturing bans in the latter cases because (1) a manufacturing ban could not apply to used refrigerants, and (2) purchase and use of ozone-depleting refrigerants by some individuals, in this case certified technicians, is legal.

L. Reporting and Recordkeeping Requirements

In order to implement the section 608 and 609 requirements, EPA requires reporting and recordkeeping, under §82.166, from a number of persons and entities. In

the NPRM, EPA proposed to extend all of these requirements, as applicable, to persons who sell or distribute HFC or PFC refrigerants; to technicians who service HFC or PFC appliances; to persons who own HFC or PFC appliances containing more than 50 pounds of refrigerant; to reclaimers that reclaim HFC or PFC refrigerants; to equipment testing organizations that certify recovery/recycling equipment for use with HFC or PFC refrigerants; and to technician certification programs that certify technicians who maintain, service, repair, or dispose of appliances containing HFC or PFC refrigerants.

EPA received comments concerning the recordkeeping and reporting requirements associated with the proposed leak repair requirements. EPA has decided to defer action on the leak repair components of the NPRM to a future rulemaking dedicated to finalizing the proposed leak repair requirements. Additional comments that were deemed outside of the scope of today's rulemaking are addressed in the "Response to Comments" document, which is available in Air Docket No. A-92-01.

EPA is finalizing such recordkeeping and reporting requirements, but only as they apply to substitute refrigerants with a class I or class II ODS component. The rationale for requiring these records for persons who handle substitute refrigerants or equipment is the same as that for requiring such records for persons who handle CFC or HCFC refrigerants or equipment, as discussed below. In all cases, the records are necessary to ensure compliance with the regulatory program implementing the section 608(c)(2) prohibition on venting and the provisions in this action authorized by section 608(a), and hence are necessary to implement and enforce section 608(c)(2) and section 608(a). These requirements make it possible for EPA to monitor compliance and enforce against violators of the Act.

1. Persons Who Sell or Distribute Refrigerant

Persons who sell or distribute or offer to sell or distribute any substitute refrigerant consisting of an ODS must retain invoices that indicate the name of the purchaser, the date of sale, and the quantity of refrigerant purchased. Distribution or offers to distribute refrigerant include persons who give refrigerant to someone else (e.g., a technician who recovers refrigerant from appliances that the technician services and gives it to another person) or who exchanges refrigerant for something else without receiving remuneration or the offer of remuneration.

Persons purchasing any substitute refrigerant consisting of an ODS refrigerant who employ certified technicians may provide evidence that at least one technician is properly certified to the wholesaler who sells them refrigerant. The wholesaler must maintain this information and is allowed to sell refrigerant to the purchaser or his authorized representative even if the authorized representative is not a properly certified technician. The purchaser must notify the wholesaler in the event that the purchaser no longer employs at least one properly certified technician, at which time the wholesaler is prohibited from selling refrigerant to the purchaser until the purchaser once again provides evidence that he or she employs at least one certified technician.

2. Technicians

Certified technicians who service, repair, maintain, or dispose of appliances must keep a copy of their certificate at their place of business where they perform service, maintenance, or repair of appliances in accordance with §82.166(l). It has always been EPA's intention that technician certification cards be kept onsite at the technician's place of business where they perform maintenance, service, or repair. EPA

understands that many technicians work onsite at their customers' facilities. While technicians certainly may wish to keep a copy of their certification on their person, EPA will require that a copy be kept at the technician's place of business. EPA intends this to mean that technician certification cards are maintained at the technician's dispatch facility or home base, and not at a remote business site such as a headquarters location which is physically removed from the technician's home base.

3. Appliance Owners and Operators

Owners and operators of appliances containing 50 or more pounds of any refrigerant consisting in whole or in part of a class I or class II substance must keep service records documenting the date and type of service in accordance with §82.166(k).

4. Refrigerant Reclaimers

EPA-certified refrigerant reclaimers must certify to EPA that they will comply with the rule's requirements and must submit lists of the equipment that they use to clean and analyze refrigerants. This information enables EPA to verify reclaimers' compliance with refrigerant standards and refrigerant emissions limits. In addition, refrigerant reclaimers must maintain records of the names and addresses of persons sending them material for reclamation and the quantity of material sent to them for reclamation (§82.166(g)). This information must be maintained on a transactional basis.

Within 30 days of the end of the calendar year, reclaimers must report to EPA the total quantity of material sent to them that year for reclamation, the mass of refrigerant reclaimed that year, and the mass of waste products generated that year.

5. Recovery and Recycling Equipment Testing Organizations

Recovery/recycling equipment testing organizations must apply to EPA for approval in order to certify refrigerant recovery/recycling equipment intended for use with any substitute refrigerant consisting in whole or in part of an ODS. This application process is necessary to ensure that all approved testing organizations and their associated laboratories have the equipment and expertise to test equipment to the applicable standards. Once approved, equipment testing organizations must maintain records of the tests performed and their results, and must submit a list of all certified equipment to EPA annually. Testing organizations must also notify EPA whenever a new model of equipment is certified or whenever an existing certified model fails a scheduled certification test. This information is required to ensure that recycling and recovery equipment meets the performance standards of the regulation (§82.160 and §§82.166(c), (d), and (e)).

6. Disposers

Persons who take the final step in the disposal process (including but not limited to scrap recylcers and landfill operators) of a small appliance, room air conditioner, MVAC, or MVAC-like appliance who do not recover the refrigerant themselves must maintain copies of signed statements attesting that the refrigerant has been removed prior to final disposal of each appliance. These records help EPA verify that refrigerant is recovered at some point during the disposal process even if the final disposer does not have recovery equipment (§82.166(i)). Stickers, tags, or identifying marks on appliances would not satisfy this recordkeeping requirement unless all of the requirements of §82.156(f)(2) are followed.

7. Programs Certifying Technicians

Organizations operating technician certification programs must apply to EPA to have their programs approved. The application process ensures that the technician certification programs meet minimum standards for generating, tracking, and grading tests, and keeping records.

Approved technician certification programs have to maintain records including the names of certified technicians and the unique numbers assigned to each technician certified through their programs. These records allow both the Agency and the certification program to verify certification claims and to monitor the certification process.

M. Economic Analysis

The Agency has performed a cost benefit analysis of this regulation, which is available for review in the public docket for this rulemaking. This analysis is summarized below.

1. Baseline

Since these regulations are being promulgated in addition to other provisions that affect the use of substitute refrigerants, the baseline for this analysis must reflect the state of affairs after the implementation of previous provisions of the Clean Air Act, and before the implementation of the final rule.

The provision of the Act that must be considered when defining the baseline for these regulations is the prohibition on venting contained in section 608(c)(2), which is self-effectuating. This prohibition makes it illegal to knowingly vent (during the maintenance, service, repair, or disposal of an appliance) any substitute for a class I or class II ODS used as a refrigerant. EPA interprets this to mean that all HFC and PFC

refrigerants, including those consisting of a class I or class II ODS, must not be vented to the atmosphere in the course of maintaining, repairing, servicing, or disposing of appliances.

2. Costs

Since the regulatory language of the National Recycling and Emission Reduction Program and the statutory language of Section 608 of the Clean Air Act largely address the requirements of the Substitutes Recycling Rule, it is assumed that compliance with refrigerant recovery, technician certification, equipment certification, and leak repair requirements is 100 percent in the baseline. Compliance with the sales restriction is assumed to be 99 percent in the baseline. As such, this rule serves primarily as a clarification, unequivocally extending these requirements to all refrigerants containing class I or class II ODS, in whole or in part.

Finally, it is assumed that most members of the regulated community are in full compliance with recordkeeping and reporting requirements in the baseline, with the exception of 20 percent of refrigerant wholesalers and owners of industrial process refrigeration equipment that deal with ODS-containing refrigerant blends.

The costs of the substitutes recycling rule consist of the costs of the sales restriction requirements and the reporting and record-keeping requirements. The Agency estimates that the cost for this regulatory program for the period 2004 -2015, is approximately $3.1 million at a 2 percent discount rate, and $2.6 million at a 7 percent discount rate. Annualized costs are estimated to be approximately $269 thousand at a 2 percent discount rate, and $295 thousand at a 7 percent discount rate.

3. Benefits

The benefits of the provisions discussed above consist of avoided damage to human health and the environment that would occur if, without regulation, environmentally harmful refrigerants were released rather than recovered.

The EPA's estimates of human health and environmental benefits were developed using a similar methodology as that used in the 1993 RIA. Specifically, the amount of avoided refrigerant emissions from the equipment certification and sales restriction rule components was calculated, and the associated number of avoided health effects (e.g., cataract incidence and skin cancer incidence and mortality) was estimated. Once the number of avoided health effects was estimated, benefits were monetized based on the estimated value of a saved life (VSL) and the cost of treating cataracts and non-fatal skin cancers.

The regulatory impact analysis assumes that the rule increases compliance with the sales restriction component of the rule. The benefits associated with equipment certification were also assessed in this analysis, as they were not quantified in the 1993 RIA. The Agency estimates the benefits to be nearly $150,000 at a 2 percent discount rate, or approximately $20,000 at a 7 percent discount rate.

V. STATUTORY AND EXECUTIVE ORDER REVIEWS

A. Executive Order 12866: Regulatory Planning and Review

Under Executive Order 12866, [58 Federal Register 51,735 (October 4, 1993)] the Agency must determine whether the regulatory action is "significant" and therefore subject to OMB review and the requirements of the Executive Order. The Order defines "significant regulatory action" as one that is likely to result in a rule that may:

(1) have an annual effect on the economy of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities;

(2) create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;

(3) materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or

(4) raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order.

It has been determined that this rule is not a "significant regulatory action" under the terms of Executive Order 12866 and is therefore not subject to EO 12866 review.

B. Paperwork Reduction Act

The information collection requirements in this rule were submitted for approval to the Office of Management and Budget (OMB) under the Paperwork Reduction Act, 44 U.S.C. 3501 et seq. An Information Collection Request (ICR) document has been prepared by EPA (ICR No.1626.07, and OMB Control number: 2060-0256) and a copy may be obtained from Sandy Farmer by mail at OPPE Regulatory Information Division; U.S. Environmental Protection Agency (2137); 401 M St., S.W.; Washington, D.C. 20460; by email at farmer.sandy@epa.gov; or by calling (202) 260-2740. A copy may also be downloaded off the Internet at www.epa.gov/icr.

OMB has approved the information collection requirements contained in this rule under the provisions of the Paperwork Reduction Act, 44 U.S.C. 3501 et seq. and has

assigned OMB control number 2060-0256.

Burden means the total time, effort, or financial resources expended by persons to generate, maintain, retain, or disclose or provide information to or for a Federal Agency. This includes the time needed to review instructions; develop, acquire, install, and utilize technology and systems for the purposes of collecting, validating, and verifying information, processing and maintaining information, and disclosing and providing information; adjust the existing ways to comply with any previously applicable instructions and requirements; train personnel to be able to respond to a collection of information; search data sources; complete and review the collection of information; and transmit or otherwise disclose the information. EPA does not expect this rule to be a burden on time or financial resources.

An Agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a currently valid OMB control number. The OMB control numbers for EPA's regulations are listed in 40 CFR Part 9 and 48 CFR Chapter 15.

C. Regulatory Flexibility Act

EPA has determined that it is not necessary to prepare a regulatory flexibility analysis in connection with this final rule. For purposes of assessing the impacts of today's rule on small entities, small entity is defined as: (1) a small business as defined by Small Business Administration size standards (see table below); (2) a small governmental jurisdiction that is a government of a city, county, town, school district or special district with a population of less than 50,000; and (3) a small organization that is any not-for-profit enterprise which is independently owned and operated and is not

dominant in its field.

After considering the economic impacts of today's final rule on small entities, EPA has concluded that this action will not have a significant economic impact on a substantial number of small entities. EPA has considered the economic impacts of today's final rule on small entities. Specifically, this rule economically impacts small entities that manufacture, distribute, or sell ODS-containing refrigerant blends, as well as those that maintain and repair equipment containing those blends. EPA has determined that today's rulemaking will potentially affect approximately 819 small entities. These small entities will experience an impact ranging from 0.001 percent to 0.163 percent, based on their estimated annual sales and revenues. EPA has also concluded that no small entities will experience an economic impact of greater than 1 percent.

EPA performed a detailed screening analysis in 1992 of the impact of the recycling regulation for ozone-depleting refrigerants on small entities. The methodology of this analysis is discussed at length in the May 14, 1993 regulation (58 FR 28710), and its associated Information Collection Request (ICR) No. 1626.07/OMB No. 2060-0256. In addition, EPA has prepared a Small Business Screening Analysis for this final rulemaking (Docket Number A-92-01). A summary of the small entities and their associated economic impact is summarized below according to the following North American Industry Classification System (NAICS) codes.

Although this final rule will not have a significant economic impact on a substantial number of small entities, EPA nonetheless has tried to reduce the impact of this rule on small entities. EPA has reconsidered portions of the NPRM in part due to

the small business concerns raised by the public. Today's action also removes duplicative regulation by exempting certain substitute refrigerants from the statutory venting prohibition on the basis that their releases are covered under other laws, regulations, or statutes.

2004 Compliance Costs per Small Company by NAICS Code and Rule Component

NAICS Codes	NAICS Description & Number of Affected Small Companies	Sales Restriction	Recordkeeping	TOTAL COST (2004)
325120	Industrial Gas Manufacturing Affected Small Companies: 5	$1,112	$0	$5,560
42111	Automobiles & Other Motor Vehicle Wholesalers Affected Small Companies: 88	$0	$400	$35,200
42114	Motor Vehicle Supplies & New Parts Wholesalers Affected Small Companies: 99	$0	$400	$39,600

NAICS Codes	NAICS Description & Number of Affected Small Companies	Sales Restriction	Recordkeeping	TOTAL COST (2004)
42193	Recyclable Material Wholesalers Affected Small Companies: 107	$0	$105	$11,235
4226901	Industrial Gas Wholesalers Affected Small Companies: 37 (sales restriction) 7 (recordkeeping)	$30	$400	$3,910

NAICS Codes	NAICS Description & Number of Affected Small Companies	Sales Restriction	Recordkeeping	TOTAL COST (2004)
441310	Automotive Parts & Accessories Stores Affected Small Companies: 232 (sales restriction); 46 (recordkeeping)	$10	$400	$20,720
541380	Environmental Test Laboratories/Services Affected Small Companies: 1	$0	$0	$0

NAICS Codes	NAICS Description & Number of Affected Small Companies	Sales Restriction	Recordkeeping	TOTAL COST (2004)
81131	Commercial/Industrial Machinery & Equipment Repair & Maintenance Affected Small Companies: 251	$0	$1,250	$313,750
TOTAL NUMBER AFFECTED		274	598	819
TOTAL COST		$8,990	$420,985	$429,975

D. Unfunded Mandates Reform Act

Title II of the Unfunded Mandates Reform Act of 1995 (UMRA), P.L. 104-4, establishes requirements for Federal agencies to assess the effects of their regulatory actions on State, local, and tribal governments and the private sector. Under section 202 of the UMRA, EPA generally must prepare a written statement, including a cost-benefit analysis, for proposed and final rules with "Federal mandates" that may result in expenditures to State, local, and tribal governments, in the aggregate, or to the private sector of $100 million or more in any one year. Before promulgating an EPA rule for which a written statement is needed, section 205 of the UMRA generally requires EPA to identify and consider a reasonable number of regulatory alternatives and adopt the least costly, most cost-effective or least burdensome alternative that achieves the objectives of the rule. The provisions of section 205 do not apply when they are inconsistent with applicable law. Moreover, section 205 allows EPA to adopt an alternative other than the least costly, most cost-effective or least burdensome alternative if the Administrator publishes with the final rule an explanation why that alternative was not adopted. Before EPA establishes any regulatory requirements that may significantly or uniquely affect small governments, including tribal governments, it must have developed under section 203 of the UMRA a small government Agency plan. The plan must provide for notifying potentially affected small governments, enabling officials of affected small governments to have meaningful and timely input in the development of EPA regulatory proposals with significant Federal intergovernmental mandates, and informing, educating, and advising small governments on compliance with the regulatory requirements.

EPA has determined that this rule does not contain a Federal mandate that may result in expenditures of $100 million or more for State, local, and tribal governments, in the aggregate, or the private sector in any one year. This rule supplements the statutory self-effectuating prohibition against venting refrigerants by ensuring that certain service practices are conducted that reduce emissions, establish equipment and reclamation certification requirements. These standards are amendments to the recycling standards under section 608 of the Clean Air Act. Many of these standards involve reporting requirements and are not expected to be a high cost issue. Thus, today's rule is not subject to the requirements of sections 202 and 205 of the UMRA.

For the reasons outlined above, EPA has also determined that this rule contains no regulatory requirements that might significantly or uniquely affect small governments. Thus, today's rule is not subject to the requirements of section 203 of the UMRA.

E. Executive Order 13132: Federalism

Executive Order 13132, entitled “Federalism” (64 FR 43255, August 10, 1999), requires EPA to develop an accountable process to ensure “meaningful and timely input by State and local officials in the development of regulatory policies that have federalism implications.” “Policies that have federalism implications” is defined in the Executive Order to include regulations that have “substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.”

This final rule does not have federalism implications. It will not have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels

of government, as specified in Executive Order 13132. The regulations promulgated under today's action are done so under Title VI of the Act which does not grant delegation rights to the States. Thus, Executive Order 13132 does not apply to this rule.

F. Executive Order 13175: Consultation and Coordination with Indian Tribal Governments

Executive Order 13175, entitled "Consultation and Coordination with Indian Tribal Governments" (65 FR 67249, November 9, 2000), requires EPA to develop an accountable process to ensure "meaningful and timely input by tribal officials in the development of regulatory policies that have tribal implications." This final rule does not have tribal implications, as specified in Executive Order 13175. Today's rule does not significantly or uniquely affect the communities of Indian tribal governments. This final rule amends the refrigerant recycling standards which have been developed to protect the stratospheric ozone layer. Thus, Executive Order 13175 does not apply to this rule.

G. Executive Order 13045**:** Protection of Children from Environmental Health & Safety Risks

Executive Order 13045: Protection of Children from Environmental Health & Safety Risks (62 F.R. 19885, April 23, 1997) applies to any rule that: (1) is determined to be "economically significant" as defined under E.O. 12866, and (2) concerns an environmental health or safety risk that EPA has reason to believe may have a disproportionate effect on children. If the regulatory action meets both criteria, the Agency must evaluate the environmental health or safety effects of the planned rule on children, and explain why the planned regulation is preferable to other potentially

effective and reasonably feasible alternatives considered by the Agency.

This final rule is not subject to the Executive Order because it does not concern an environmental health or safety risk that EPA has reason to believe may have a disproportionate effect on children. This rule amends the recycling standards for refrigerants to protect the stratosphere from ozone depletion, which in turn protects human health and the environment from increased amounts of UV radiation.

H. Executive Order 13211: Actions that Significantly Affect Energy Supply, Distribution, or Use

This rule is not subject to Executive Order 13211, "Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use" (66 FR 28355; May 22, 2001) because it is not a significant regulatory action under Executive Order 12866.

I. National Technology Transfer Advancement Act

Section 12(d) of the National Technology Transfer and Advancement Act of 1995 ("NTTAA"), Public Law No. 104-113, 12(d) (15 U.S.C. 272 note) directs EPA to use voluntary consensus standards in its regulatory activities unless to do so would be inconsistent with applicable law or otherwise impractical. Voluntary consensus standards are technical standards (e.g., materials specifications, test methods, sampling procedures, and business practices) that are developed or adopted by voluntary consensus standards bodies. The NTTAA directs EPA to provide Congress, through OMB, explanations when the Agency decides not to use available and applicable voluntary consensus standards.

This rulemaking involves technical standards. EPA has decided to the ARI

Standard 700-1995 into Appendix A of 40 CFR part 82, subpart F. The standard was created by one of the refrigeration industry's primary standards-setting organization, the Air-Conditioning and Refrigeration Institute (ARI).

ARI is a national trade association representing manufacturers of more than 90 percent of North American produced central air-conditioning and commercial refrigeration equipment. ARI develops and publishes technical standards for industry products, including standards for reclaimed refrigerant. Since many ARI standards are accepted as American National Standards, EPA feels that an earnest effort has been made to comply with the requirements of of NTTAA.

J. The Congressional Review Act

The Congressional Review Act, 5 U.S.C. 801 et seq., as added by the Small Business Regulatory Enforcement Fairness Act of 1996, generally provides that before a rule may take effect, the Agency promulgating the rule must submit a rule report, which includes a copy of the rule, to each House of the Congress and to the Comptroller General of the United States. EPA will submit a report containing this rule and other required information to the U.S. Senate, the U.S. House of Representatives, and the Comptroller General of the United States prior to publication of the rule in the Federal Register. A major rule cannot take effect until 60 days after it is published in the Federal Register. This action is not a "major rule" as defined by 5 U.S.C. 804(2). It will become effective [INSERT DATE 60 DAYS AFTER PUBLICATION].

(Protection of Stratospheric Ozone; Refrigerant Recycling; Substitute Refrigerants-page 129 of 158)

List of Subjects in 40 CFR Part 82

Environmental protection, Air pollution control, Reporting and recordkeeping requirements.

Michael O. Leavitt, Date

Administrator

Title 40 Chapter I of the Code of Federal Regulations, part 82, is amended as follows:

PART 82 - [AMENDED]

1. The authority citation for Part 82 continues to read as follows:

Authority: 42 U.S.C. 7414, 7601, 7671-7671q.

2. Section 82.150 is revised to read as follows:

§**82.150 Purpose and scope**.

(a) The purpose of this subpart is to reduce emissions of class I and class II refrigerants and their substitutes to the lowest achievable level by maximizing the recapture and recycling of such refrigerants during the service, maintenance, repair, and disposal of appliances and restricting the sale of refrigerants consisting in whole or in part of a class I and class II ODS in accordance with Title VI of the Clean Air Act.

(b) This subpart applies to any person servicing, maintaining, or repairing appliances. This subpart also applies to persons disposing of appliances, including small appliances and motor vehicle air conditioners. In addition, this subpart applies to refrigerant reclaimers, technician certifying programs, appliance owners and operators,

manufacturers of appliances, manufacturers of recycling and recovery equipment, approved recycling and recovery equipment testing organizations, persons selling class I or class II refrigerants or offering class I or class II refrigerants for sale, and persons purchasing class I or class II refrigerants.

3. Section 82.152 is amended by adding, in alphabetical order, definitions for “Medium-pressure appliance,” “One-time expansion device,” “Refrigerant,” “Substitute,” and by revising the definitions for “Appliance,” “High-pressure appliance,” “Low-pressure appliance,” “Opening,” “Technician,” and “Very high-pressure appliance” to read as follows:

§82.152 Definitions.

Appliance means any device which contains and uses a refrigerant and which is used for household or commercial purposes, including any air conditioner, refrigerator, chiller, or freezer.

* * * * *

High-pressure appliance means an appliance that uses a refrigerant with a liquid phase saturation pressure between 170 psia and 355 psia at 104 °F. This definition includes but is not limited to appliances using R-401A, R-409A, R-401B, R-411A, R-22, R-411B, R-502, R-402B, R-408A, and R-402A.

* * * * *

Low-pressure appliance means an appliance that uses a refrigerant with a liquid phase saturation pressure below 45 psia at 104 °F. This definition includes but is not limited to appliances using R-11, R-123, and R-113.

* * * * *

Medium-pressure appliance means an appliance that uses a refrigerant with a liquid phase saturation pressure between 45 psia and 170 psia at 104 °F. This definition includes but is not limited to appliances using R-114, R-124, R-12, R-401C, R-406A, and R-500.

* * * * *

One-time expansion device means an appliance that relies on the one-time release of its refrigerant charge to the environment in order to provide a cooling effect. *Opening* an appliance means any service, maintenance, repair, or disposal of an appliance that would release refrigerant from the appliance to the atmosphere unless the refrigerant was recovered previously from the appliance. Connecting and disconnecting hoses and gauges to and from the appliance to measure pressures within the appliance and to add refrigerant to or recover refrigerant from the appliance shall not be considered “opening.”

* * * * *

Refrigerant means, for purposes of this Subpart, any substance consisting in part or whole of a class I or class II ozone-depleting substance that is used for heat transfer purposes and provides a cooling effect, or any substance used as a substitute for such a class I or class II substance by any user in a given end-use, except for the following substitutes in the following end-uses:

(1) Ammonia in commercial or industrial process refrigeration or in absorption units;

(2) Hydrocarbons in industrial process refrigeration (processing of hydrocarbons);

(3) Chlorine in industrial process refrigeration (processing of chlorine and chlorine

compounds);

(4) Carbon dioxide in any application;

(5) Nitrogen in any application; or

(6) Water in any application.

* * * * *

Substitute means any chemical or product, whether existing or new, that is used by any person as an EPA approved replacement for a class I or II ozone-depleting substance in a given refrigeration or air-conditioning end-use.

* * * * *

Technician means any person who performs maintenance, service, or repair, that could be reasonably expected to release refrigerants from appliances, into the atmosphere. Technician also means any person who performs disposal of appliances, except for small appliances, MVACs, and MVAC-like appliances, that could be reasonably expected to release refrigerants from the appliances into the atmosphere. Performing maintenance, service, repair, or disposal could be reasonably expected to release refrigerants only if the activity is reasonably expected to violate the integrity of the refrigerant circuit. Activities reasonably expected to violate the integrity of the refrigerant circuit include activities such as attaching and detaching hoses and gauges to and from the appliance to add or remove refrigerant or to measure pressure and adding refrigerant to and removing refrigerant from the appliance. Activities such as painting the appliance, rewiring an external electrical circuit, replacing insulation on a length of pipe, or tightening nuts and bolts on the appliance are not reasonably expected to violate the integrity of the refrigerant circuit. Performing maintenance,

service, repair, or disposal of appliances that have been evacuated pursuant to §82.156 could not be reasonably expected to release refrigerants from the appliance unless the maintenance, service, or repair consists of adding refrigerant to the appliance. Technician includes but is not limited to installers, contractor employees, in-house service personnel, and in some cases owners and/or operators.

Very high-pressure appliance means an appliance that uses a refrigerant with a critical temperature below 104 °F or with a liquid phase saturation pressure above 355 psia at 104 °F. This definition includes but is not limited to appliances using R-13 or R-503.

4. Section 82.154 is amended by revising paragraphs (a), (b) introductory text, (c), and (m) introductory text; and by adding new paragraph (p) to read as follows:

§82.154 Prohibitions.

(a) Effective [INSERT DATE 60 DAYS FROM DATE OF PUBLICATION IN THE FINAL REGISTER], no person maintaining, servicing, repairing, or disposing of appliances may knowingly vent or otherwise release into the environment any refrigerant from such appliances. The knowing release of refrigerant subsequent to its recovery from an appliance shall be considered a violation of this prohibition. De minimis releases associated with good faith attempts to recycle or recover refrigerants are not subject to this prohibition. Releases shall be considered de minimis only if they occur when:

(1) The required practices set forth in §82.156 are observed, recovery or recycling machines that meet the requirements set forth in §82.158 are used, and the technician certification provisions set forth in §82.161 are observed; or

(2) The requirements set forth in subpart B of this part are observed.

(b) No person may open appliances except MVACs and MVAC-like appliances for maintenance, service, or repair, and no person may dispose of appliances except for small appliances, MVACs, and MVAC-like appliances:

* * * * *

(c) No person may manufacture or import recycling or recovery equipment for use during the maintenance, service, or repair of appliances except MVACs and MVAC-like appliances, and no person may manufacture or import recycling or recovery equipment for use during the disposal of appliances except small appliances, MVACs, and MVAC-like appliances, unless the equipment is certified pursuant to §82.158 (b) or (d), as applicable.

* * * * *

(m) No person may sell or distribute, or offer for sale or distribution, any refrigerant to any person unless:

* * * * *

(p) No person may manufacture or import one-time expansion devices that contain other than exempted refrigerants.

5. Section 82.156 is amended by revising paragraph (a) introductory text, Table 1, and paragraph (b) to read as follows:

§82.156 Required practices.

(a) All persons disposing of appliances, except for small appliances, MVACs, and MVAC-like appliances must evacuate the refrigerant, including all the liquid refrigerant, in the entire unit to a recovery or recycling machine certified pursuant to §82.158. All

persons opening appliances except for MVACs and MVAC-like appliances for maintenance, service, or repair must evacuate the refrigerant, including all the liquid refrigerant (except as provided in paragraph (a)(2)(i)(B) of this section), in either the entire unit or the part to be serviced (if the latter can be isolated) to a system receiver (e.g., the remaining portions of the appliance, or a specific vessel within the appliance) or a recovery or recycling machine certified pursuant to §82.158. A technician must verify that the applicable level of evacuation has been reached in the appliance or the part before it is opened.

* * * * *

Table 1-REQUIRED LEVELS OF EVACUATION FOR APPLIANCES

[Except for small appliances, MVACs, and MVAC-like appliances]

Type of appliance	Inches of Hg vacuum (relative to standard atmospheric pressure of 29.9 inches Hg)	
	Using recovery or recycling equipment manufactured or imported before November 15, 1993	Using recovery or recycling equipment manufactured or imported on or after November 15, 1993
Very high-pressure appliance	0	0

High-pressure appliance, or isolated component of such appliance, normally containing less than 200 pounds of refrigerant	0	0
High-pressure appliance, or isolated component of such appliance, normally containing 200 pounds or more of refrigerant	4	10
Medium-pressure appliance, or isolated component of such appliance, normally containing less than 200 pounds of refrigerant	4	10
Medium-pressure appliance, or isolated component of such appliance, normally containing 200 pounds or more of refrigerant	4	15
Low-pressure appliance	25	25 mm Hg absolute

* * * * *

(b) All persons opening appliances except for small appliances, MVACs, and MVAC-like appliances for maintenance, service, or repair and all persons disposing of appliances except small appliances, MVACs, and MVAC-like appliances must have at

least one piece of certified, self-contained recovery or recycling equipment available at their place of business. Persons who maintain, service, repair, or dispose of only appliances that they own and that contain pump-out units are exempt from this requirement. This exemption does not relieve such persons from other applicable requirements of this section.

* * * * *

6. Section 82.161 is amended by revising paragraph (a)(2) to read as follows:

§82.161 Technician certification.

(a)* * *

(2) Technicians who maintain, service, or repair medium-, high-, or very high-pressure appliances, except small appliances, MVACs, and MVAC-like appliances, or dispose of medium-, high-, or very high-pressure appliances, except small appliances, MVACs, and MVAC-like appliances, must be properly certified as Type II technicians.

* * * * *

7. Section 82.162 is amended by revising the EPA regional addresses in paragraph (a)(5) to read as follows:

§82.162 Certification by owners of recycling or recovery equipment

(a) * * *

(5) * * *

Connecticut

Maine

Massachusetts

New Hampshire

Rhode Island

Vermont

must send their certifications to:

CAA section 608 Enforcement Contact; EPA Region I; Mail Code SEA; JFK Federal Building; One Congress Street, Suite 1100; Boston, MA 02114-2023.

Owners or lessees of recycling or recovery equipment having their places of business in:

New York

New Jersey

Puerto Rico

Virgin Islands

must send their certifications to:

CAA section 608 Enforcement Contact; EPA Region II (2DECA-AC); 290 Broadway, 21ST Floor; New York, NY 10007-1866.

Owners or lessees of recycling or recovery equipment having their places of business in:

Delaware

District of Columbia

Maryland

Pennsylvania

Virginia

West Virginia

must send their certifications to:

CAA section 608 Enforcement Contact; EPA Region III-Wheeling Operations Office; Mail Code 3AP12; 303 Methodist Building; 11th and Chapline Streets; Wheeling, WV 26003.

Owners or lessees of recycling or recovery equipment having their places of business in:

Alabama

Florida

Georgia

Kentucky

Mississippi

North Carolina

South Carolina

Tennessee

must send their certifications to:

CAA section 608 Enforcement Contact; EPA Region IV(APT-AE); Atlanta Federal Center; 61 Forsyth Street, SW; Atlanta, GA 30303.

Owners or lessees of recycling or recovery equipment having their places of business in:

Illinois

Indiana

Michigan

Minnesota

Ohio

Wisconsin

must send their certifications to:

CAA section 608 Enforcement Contact, EPA Region V (AE17J); 77 West Jackson Blvd.; Chicago, IL 60604-3507.

Owners or lessees of recycling or recovery equipment having their places of business in:

Arkansas

Louisiana

New Mexico

Oklahoma

Texas

must send their certifications to:

CAA section 608 Enforcement Contact; EPA Region VI (6EN-AA); 1445 Ross Avenue, Suite 1200; Dallas, Texas 75202.

Owners or lessees of recycling or recovery equipment having their places of business in:

Iowa

Kansas

Missouri

Nebraska

must send their certifications to:

CAA section 608 Enforcement Contact; EPA Region VII; Mail Code APCO/ARTD; 901 North 5th Street; Kansas City, KS; 66101.

Owners or lessees of recycling or recovery equipment having their places of business in:

Colorado

Montana

North Dakota

South Dakota

Utah

Wyoming

must send their certifications to:

CAA section 608 Enforcement Contact, EPA Region VIII, Mail Code 8ENF-T, 999 18th Street, Suite 500, Denver, CO 80202-2466.

Owners or lessees of recycling or recovery equipment having their places of business in:

American Samoa

Arizona

California

Guam

Hawaii

Nevada

must send their certifications to:

CAA section 608 Enforcement Contact; EPA Region IX; Mail Code AIR-5; 75 Hawthorne Street; San Francisco, CA 94105.

Owners or lessees of recycling or recovery equipment having their places of business

in:

Alaska

Idaho

Oregon

Washington

must send their certifications to:

CAA section 608 Enforcement Contact; EPA Region X (OAQ-107); 1200 Sixth Avenue; Seattle, WA 98101.

* * * * *

8. Section 82.164 is amended by revising the introductory text and paragraphs (a), (b), and (e)(3) to read as follows:

§82.164 Reclaimer certification.

Effective [INSERT DATE 60 DAYS FROM DATE OF PUBLICATION IN THE FINAL REGISTER] all persons reclaiming used refrigerant for sale to a new owner, except for persons who properly certified under this section prior to [INSERT DATE 60 DAYS FROM DATE OF PUBLICATION IN THE FINAL REGISTER] must certify to the Administrator that such person will:

(a) Reprocess refrigerant to all of the specifications in Appendix A of this subpart (based on ARI Standard 700-1995, *Specification for Fluorocarbons and Other Refrigerants*) that are applicable to that refrigerant;

(b) Verify that the refrigerant meets these specifications using the analytical methodology prescribed in Appendix A, which includes the primary methodologies included in the appendix to the ARI Standard 700-1995;

* * * * *

(e) * * *

(3) The owner or a responsible officer of the reclaimer must sign the certification stating that the refrigerant will be reprocessed to all of the specifications in Appendix A of this subpart (based on ARI Standard 700-1995, *Specification for Fluorocarbons and Other Refrigerants*) that are applicable to that refrigerant, that the refrigerant's conformance to these specifications will be verified using the analytical methodology prescribed in Appendix A (which includes the primary methodologies included in the appendix to the ARI Standard 700-1995), that no more than 1.5 percent of the refrigerant will be released during the reclamation process, that wastes from the reclamation process will be properly disposed of, that the owner or responsible officer of the reclaimer will maintain records and submit reports in accordance with §82.166(g) and (h), and that the information given is true and correct. The certification should be sent to the following address: U.S. Environmental Protection Agency; Global Programs Division (6205J); 1200 Pennsylvania Avenue, NW; Washington, DC 20460; Attn: Section 608 Recycling Program Manager-Reclaimer Certification.

* * * * *

9. Section 82.166 is amended by revising paragraphs (a) and (b) to read as follows:

§82.166 Reporting and recordkeeping requirements.

(a) All persons who sell or distribute or offer to sell or distribute any refrigerant must retain invoices that indicate the name of the purchaser, the date of sale, and the quantity of refrigerant purchased.

(b) Purchasers of refrigerant who employ certified technicians may provide

evidence that at least one technician is properly certified to the wholesaler who sells them refrigerant; the wholesaler must then keep this information on file and may sell refrigerant to the purchaser or his authorized representative even if such purchaser or authorized representative is not a properly certified technician. In such cases, the purchaser must notify the wholesaler in the event that the purchaser no longer employs at least one properly certified technician. The wholesaler is then prohibited from selling refrigerants to the purchaser until such time as the purchaser employs at least one properly certified technician. At that time, the purchaser must provide new evidence that at least one technician is properly certified.

* * * * *

10. Appendix A to subpart F is revised to read as follows:

APPENDIX A TO SUBPART F OF PART 82 - SPECIFICATIONS FOR FLUOROCARBONS AND OTHER REFRIGERANTS

This appendix is based on the Air-Conditioning and Refrigeration Institute Standard 700-1995.

Section 1. Purpose

1.1 *Purpose.* The purpose of this standard is to evaluate and accept/reject refrigerants regardless of source (i.e., new, reclaimed and/or repackaged) for use in new and existing refrigeration and air-conditioning products as required under 40 CFR part 82.

1.1.1 *Intent.* This standard is intended for the guidance of the industry including manufacturers, refrigerant reclaimers, repackagers, distributors, installers, servicemen, contractors and for consumers.

1.1.2 *Review and Amendment.* This standard is subject to review and amendment as the technology advances.

Section 2. Scope

2.1 *Scope.* This standard specifies acceptable levels of contaminants (purity requirements) for various fluorocarbon and other refrigerants regardless of source and lists acceptable test methods. These refrigerants are R-113; R-123; R-11; R-114; R-124; R-12; R-401C; R-406A; R-500; R-401A; R-409A; R-401B; R-411A; R-22; R-411B; R-502; R-402B; R-408A; R-402A; R-13; R-503 as referenced in the ANSI/ASHRAE Standard 34-1992. (American Society of Heating, Refrigerating and Air-conditioning Engineers, Inc., Standard 34-1992). Copies may be obtained from ASHRAE Publications Sales, 1791 Tullie Circle, NE, Atlanta, GA 30329. Copies may also be inspected at Environmental Protection Agency; Office of Air and Radiation Docket; 1301 Constitution Ave., NW; Room B108; Washington, D.C. 20460.

Section 3. Definitions

3.1 *"Shall," "Should," "Recommended," or "It Is Recommended."* "Shall," "should," "recommended," or "it is recommended" shall be interpreted as follows:

3.1.1 *Shall.* Where "shall" or "shall not" is used for a provision specified, that provision is mandatory if compliance with the appendix is claimed.

3.1.2 *Should, Recommended*, or *It is Recommended.* "Should ", "recommended", or "it is recommended" is used to indicate provisions which are not mandatory but which are desirable as good practice.

Section 4. Characterization of Refrigerants and Contaminants

4.1 *Characterization.* Characterization of refrigerants and contaminants addressed are listed in the following general classifications:

4.1.1 Characterization

a. Gas Chromatography

b. Boiling point and boiling point range

4.1.2 *Contaminants*

a. Water

b. Chloride

c. Acidity

d. High boiling residue

e. Particulates/solids

f. Non-condensables

g. Impurities including other refrigerants

Section 5. Sampling, Summary of Test Methods and Maximum Permissible Contaminant Levels

5.1 *Referee Test.* The referee test methods for the various contaminants are summarized in the following paragraphs. Detailed test procedures are included in *Appendix-C to ARI Standard 700-1995: Analytical Procedures for ARI Standard 700-1995*, 1995, Air-Conditioning and Refrigeration Institute. *Appendix C to ARI Standard 700-1995* is incorporated by reference. [This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies may be obtained from the Air-Conditioning and Refrigeration Institute,

4301 North Fairfax Drive, Arlington, Virginia 22203. Copies may also be inspected at Public Docket No. A-92-01, Environmental Protection Agency, 1301 Constitution Ave., NW; Washington, DC, 20460 or at the Office of the Federal Register, 800 North Capitol Street, NW, Suite 700, Washington, DC.] If alternative test methods are employed, the user must be able to demonstrate that they produce results equivalent to the specified referee method.

5.2 *Refrigerant Sampling*

5.2.1 Sampling Precautions. Special precautions should be taken to assure that representative samples are obtained for analysis. Sampling shall be done by trained laboratory personnel following accepted sampling and safety procedures.

5.2.2 *Gas Phase Sample.* A gas phase sample shall be obtained for determining the non-condensables. Since non-condensable gases, if present, will concentrate in the vapor phase of the refrigerant, care must be exercised to eliminate introduction of air during the sample transfer. Purging is not an acceptable procedure for a gas phase sample since it may introduce a foreign product. Since R-11, R-113, and R-123 have normal boiling points at or above room temperature, non-condensable determination is not required for these refrigerants.

5.2.2.1 *Connection.* The sample cylinder shall be connected to an evacuated gas sampling bulb by means of a manifold. The manifold should have a valve arrangement that facilitates evacuation of all connecting tubing leading to the sampling bulb.

5.2.2.2 *Equalizing Pressures.* After the manifold has been evacuated, close the valve to the pump and open the valve on the system. Allow the

pressure to equilibrate and close valves.

5.2.3 *Liquid Phase Sample*. A liquid phase sample is required for all tests listed in this standard except the test for non-condensables.

5.2.3.1 *Preparation.* Place a clean, empty sample cylinder with the valve open in an oven at 110°C (230°F) for one hour. Remove it from the oven while hot, immediately connect to an evacuation system and evacuate to less than 1 mm mercury (1000 microns). Close the valve and allow it to cool. Weigh the empty cylinder.

5.2.3.2 *Manifolding.* The valve and lines from the unit to be sampled shall be clean and dry. The cylinder shall be connected to an evacuated gas sampling cylinder by means of a manifold. The manifold should have a valve arrangement that facilitates evacuation of all connecting tubing leading to the sampling cylinder.

5.2.3.3 *Liquid Sampling.* After the manifold has been evacuated, close the valve to the pump and open the valve on the system. Take the sample as a liquid by chilling the sample cylinder slightly. Accurate analysis requires that the sample container be filled to at least 60% by volume, however under no circumstances should the cylinder be filled to more than 80% by volume. This can be accomplished by weighing the empty cylinder and then the cylinder with refrigerant. When the desired amount of refrigerant has been collected, close the valve(s) and disconnect the sample cylinder immediately.

5.2.3.4 *Record Weight.* Check the sample cylinder for leaks and record

the gross weight.

5.3 Refrigerant Characterization.

5.3.1 *Primary Method.* The primary method shall be gas chromatography (GC) as described in *Appendix-C to ARI Standard 700-1995*. The chromatogram of the sample shall be compared to known standards.

5.3.2 *Alternative Method.* Determination of the boiling point and boiling point range is an acceptable alternative test method which can be used to characterize refrigerants. The test method shall be that described in the Federal Specification for "Fluorocarbon Refrigerants," BB-F-1421 B, dated March 5, 1982, section 4.4.3.

5.3.3 *Required Values.* The required values for boiling point and boiling point range are given in Table 1A, *Physical Properties of Single Component Refrigerants*; Table 1B, *Physical Properties of Zeotropic Blends (400 Series Refrigerants)*; and Table 1C, *Physical Properties of Azeotropic Blends (500 Series Refrigerants)*.

5.4 Water Content.

5.4.1 *Method.* The Coulometric Karl Fischer Titration shall be the primary test method for determining the water content of refrigerants. This method is described in *Appendix-C to ARI Standard 700-1995*. This method can be used for refrigerants that are either a liquid or a gas at room temperature, including refrigerants 11, 113, and 123. For all refrigerants, the sample for water analysis shall be taken from the liquid phase of the container to be tested. Proper operation of the analytical method requires special equipment and an

experienced operator. The precision of the results is excellent if proper sampling and handling procedures are followed. Refrigerants containing a colored dye can be successfully analyzed for water using this method.

5.4.2 *Limits.* The value for water content shall be expressed as parts per million (ppm) by weight and shall not exceed the maximum specified (see Tables 1A, 1B, and 1C).

5.5 *Chloride.*

The refrigerant shall be tested for chloride as an indication of the presence of hydrochloric acid and/or metal chlorides. The recommended procedure is intended for use with new or reclaimed refrigerants. Significant amounts of oil may interfere with the results by indicating a failure in the absence of chloride.

5.5.1 *Method.* The test method shall be that described in *Appendix-C to ARI Standard 700-1995.* The test will show noticeable turbidity at chloride levels of about 3 ppm by weight or higher.

5.5.2 *Turbidity.* The results of the test shall not exhibit any sign of turbidity. Report the results as "pass" or "fail."

5.6 *Acidity.*

5.6.1 *Method.* The acidity test uses the titration principle to detect any compound that is highly soluble in water and ionizes as an acid. The test method shall be that described in *Appendix-C to ARI Standard 700-1995.* This test may not be suitable for determination of high molecular weight organic acids; however these acids will be found in the high boiling residue test outlined in 5.7. The test requires a 100 to 120 gram sample and has a detection limit of 0.1 ppm by

weight calculated as HCl.

5.6.2 *Limits.* The maximum permissible acidity is 1 ppm by weight as HCl.

5.7 High Boiling Residue.

5.7.1 *Method.* High boiling residue shall be determined by measuring the residue of a standard volume of refrigerant after evaporation. The refrigerant sample shall be evaporated at room temperature or at a temperature 45°C (115°F) for all refrigerants, except R-113 which shall be evaporated at 60°C (140°F), using a Goetz bulb as specified in *Appendix-C to ARI Standard 700-1995*. Oils and/or organic acids will be captured by this method.

5.7.2 *Limits.* The value for high boiling residue shall be expressed as a percentage by volume and shall not exceed the maximum percent specified (see Tables 1A, 1B, and 1C). An alternative gravimetric method is described in *Appendix-C to ARI Standard 700-1995*.

5.8 Method of Tests for Particulates and Solids.

5.8.1 *Method.* A measured amount of sample is evaporated from a Goetz bulb under controlled temperature conditions. The particulates/solids shall be determined by visual examination of the Goetz bulb prior to the evaporation of refrigerant. Presence of dirt, rust or other particulate contamination is reported as "fail." For details of this test method, refer to Part 3 of *Appendix-C to ARI Standard 700-1995.*

5.9 *Non-Condensables*.

5.9.1 *Sample.* A vapor phase sample shall be used for determination of non-condensables. Non-condensable gases consist primarily of air accumulated in the vapor phase of refrigerants. The solubility of air in the refrigerants liquid phase is extremely low and air is not significant as a liquid phase contaminant. The presence of non-condensable gases may reflect poor quality control in transferring refrigerants to storage tanks and cylinders.

5.9.2 *Method.* The test method shall be gas chromatography with a thermal conductivity detector as described in *Appendix-C to ARI Standard 700-1995.*

5.9.3 *Limit.* The maximum level of non-condensables in the vapor phase of a refrigerant in a container shall not exceed 1.5% by volume (see Tables 1A, 1B, and 1C).

5.10 *Impurities, including Other Refrigerants.*

5.10.1 *Method*. The amount of other impurities including other refrigerants in the subject refrigerant shall be determined by gas chromatography as described in *Appendix-C to ARI Standard 700-1995.*

5.10.2 *Limit.* The subject refrigerant shall not contain more than 0.5% by weight of impurities including other refrigerants (see Tables 1A, 1B, and 1C).

Section 6. Reporting Procedure

6.1 *Reporting Procedure.* The source (manufacturer, reclaimer or repackager) of the packaged refrigerant shall be identified. The refrigerant shall be identified by its accepted refrigerant number and/or its chemical name. Maximum permissible

levels of contaminants are shown in Tables 1A, 1B, and 1C. Test results shall be tabulated in a like manner.

Physical Properties of Single Component Refrigerants

	Reporting Units	Reference (Subclause)	R-11	R-12	R-13	R-22	R-113	R-114	R-123
RISTICS:									
[1]	°F @ 1.00 atm	---	74.9	-21.6	-114.6	-41.4	117.6	38.8	82.6
	°C @ 1.00 atm	---	23.8	-29.8	-81.4	-40.8	47.6	3.8	27.9
Range[1]	K	---	0.3	0.3	0.5	0.3	0.3	0.3	0.3
er Content	by weight	---					0-1% R-113a	0-30% R-114a	0-8% R-123a
SE CONTAMINANTS:									
non-condensables	% by volume @ 25°C	5.9	N/A[2]	1.5	1.5	1.5	N/A[2]	1.5	N/A[2]
SE CONTAMINANTS:									
	ppm by weight	5.4	20	10	10	10	20	10	20
urities including refrigerants	% by weight	5.1	0.50	0.50	0.50	0.50	0.50	0.50	0.50
residue	% by volume	5.7	0.01	0.01	0.05	0.01	0.03	0.01	0.01
olids	Visually clean to pass	5.8	pass	pass	pass	pass	pass	pass	pass
	ppm by weight	5.6	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	No visible turbidity	5.5	pass	pass	pass	pass	pass	pass	pass

ıts and boiling point ranges, although not required, are provided for informational purposes.

R-13, and R-123 have normal boiling points at or above room temperature, non-condensable determinations are not required for these refrigerants.

chloride level for pass/fail is 3ppm.

Table 1B. Physical Properties of Zeotropic Blends (400 Series Refrigerants)

	Reporting Units	Reference (Subclause)	R-401A	R-401B	R-402A
CHARACTERISTICS:					
Refrigerant Components			R-22/152a/124	R-22/152a/124	R-125/290/22
Nominal Comp, weight%			53/13/34	61/11/28	60/2/38
Allowable Comp, weight%			51-54/11.5-13.5/33-35	59-63/9.5-11.5/27-29	58-62/1-3/ 36-40
Boiling Point [1]	°F @ 1.00 atm	---	-27.7 to -18.1	-30.4 to -21.2	-54.8 to -53.9
	°C @ 1.00 atm	---	-33.2 to -27.8	-34.7 to -29.6	-48.2 to -47.7
Boiling Point Range [1]	K	---	5.4	5.1	0.5
VAPOR PHASE CONTAMINANTS:					
Air and other non-condensables	% by volume @ 25°C	5.9	1.5	1.5	1.5
LIQUID PHASE CONTAMINANTS:					
Water	ppm by weight	5.4	10	10	10
All other impurities including refrigerants	% by weight	5.1	0.50	0.50	0.50
High boiling residue	% by volume	5.7	0.01	0.01	0.01
Particulates/solids	Visually clean to pass	5.8	pass	pass	pass
Acidity	ppm by weight	5.6	1.0	1.0	1.0
Chlorides [2]	No visible turbidity	5.5	pass	pass	pass

[1] Boiling points and boiling point ranges, although not required, are provided for informational purposes.

[2] Recognized chloride level for pass/fail is 3ppm.

[3] Column denotes refrigerants for which analytical data is not available.

(continued). Physical Properties of Zeotropic Blends (400 Series Refrigerants)

	Reporting Units	Reference (Subclause)	R-407C	R-408A	R-409A	R-410A	R-410B	R-411A [3]
ISTICS:								
mponents			R-32/125/134a	R125/143a/22	R22/124/142b	R32/125	R32/125	R1270/22/152a
weight%			23/25/52	7/46/47	60/25/15	50/50	45/55	1.5/87.5/11.0
, weight%			22-24/23-27/ 50-54	5-9/45-47/ 45-49	58-62/23-27/ 14-16	48.5-50.5/ 49.4-51.5	44-46/54-56	0.5-1.5/87.5-89.5/ 10-11
	°F @ 1.00 atm	---	46.4 to -33.0	-48.8 to -47.9	-32.4 to -18.2	-60.1 to -60.0	-60.3 to -60.2	
	°C @ 1.00 atm	---	-43.6 to -36.6	-44.9 to -44.4	-35.8 to -27.9	-51.2 to -51.1	-51.3 to -51.2	
nge [1]	K	---	7.0	0.5	7.9	0.1	0.1	
CONTAMINANTS: n-condensables	% by volume @ 25°C	5.9	1.5	1.5	1.5	1.5	1.5	1.5
CONTAMINANTS:								
	ppm by weight	5.4	10	10	10	10	10	10
ies including refrigerants	% by weight	5.1	0.50	0.50	0.50	0.50	0.50	0.50
due	% by volume	5.7	0.01	0.01	0.01	0.01	0.01	0.01
ls	Visually clean to pass	5.8	pass	pass	pass	pass	pass	pass
	ppm by weight	5.6	1.0	1.0	1.0	1.0	1.0	1.0
	No visible turbidity	5.5	pass	pass	pass	pass	pass	pass

and boiling point ranges, although not required, are provided for informational purposes.

oride level for pass/fail is 3ppm.

s denote refrigerants for which analytical data is not available.

Table 1C. Physical Properties of Azeotropic Blends (500 Series Refrigerants)

	Reporting Units	Reference (Subclause)	R500	R502	R503	R507	
CHARACTERISTICS:							
Refrigerant Components			R12/152a	R22/115	R23/13	R125/143a	
Nominal Comp, weight%			73.8/26.2	48.8/51.2	40.1/59.9	50/50	
Allowable Comp, weight%			72.8-74.8/ 25.2-27.2	44.8-52.8/ 47.2-55.2	39-41/ 59-61	49-51/ 49-51	
Boiling Point [1]	°F @ 1.00 atm	---	-28.1	-49.7	-127.7	-52.1	
	°C @ 1.00 atm	---	-33.4	-45.4	-88.7	-46.7	
Boiling Point Range [1]	K	---	0.5	0.5	0.5	0.5	
VAPOR PHASE CONTAMINANTS:							
Air and other non-condensables	% by volume @ 25°C	5.9	1.5	1.5	1.5	1.5	
LIQUID PHASE CONTAMINANTS:							
Water	ppm by weight	5.4	10	10	10	10	
All other impurities including refrigerants	% by weight	5.1	0.50	0.50	0.50	0.50	
High boiling residue	% by volume	5.7	0.05	0.01	0.01	0.01	
Particulates/solids	Visually clean to pass	5.8	pass	pass	pass	pass	
Acidity	ppm by weight	5.6	1.0	1.0	1.0	1.0	
Chlorides [2]	No visible turbidity	5.5	pass	pass	pass	pass	

[1] Boiling points and boiling point ranges, although not required, are provided for informational purposes.

[2] Recognized chloride level for pass/fail is 3ppm.

[3] Shaded columns denote refrigerants for which analytical data is not available.

APPENDIX A. REFERENCES - NORMATIVE

Listed here are all standards, handbooks, and other publications essential to the formation and implementation of the standard. All references in this appendix are considered as part of this standard.

ASHRAE Terminology of Heating, Ventilating, Air Conditioning and Refrigeration, American Society of Heating Refrigeration and Air-Conditioning Engineers, 1992, 1791 Tullie Circle N.E., Atlanta, GA 30329-2305; U.S.A.

ASHRAE Standard 34-1992, *Number Designation and Safety Classification of Refrigerants*, American Society of Heating Refrigeration and Air-Conditioning Engineers, 1992, 1791 Tullie Circle N.E., Atlanta, GA 30329-2305; U.S.A.

Appendix C to ARI Standard 700-1995: Analytical Procedures to ARI Standard 700-1995, Specifications for Fluorocarbon and Other Refrigerants, Air-Conditioning and Refrigeration Institute, 1995, 4301 North Fairfax Drive, Suite 425, Arlington, VA 22203; U.S.A.

Federal Specification for *Fluorocarbon Refrigerants, BB-F-1421-B,* dated March 5, 1992, Office of the Federal Register, National Archives and Records Administration, 1992, 800 North Capitol Street, N.W., Washington, D.C. 20402; U.S.A.

11 Appendix A1 to subpart F is added to read as follows:

APPENDIX A1 TO SUBPART F OF PART 82 - GENERIC MAXIMUM CONTAMINANT LEVELS

Contaminant	Reporting Units
Air and Other Non-condensables	1.5% by volume @ 25°C (N/A for refrigerants used in low-pressure appliances [1])
Water	10 ppm by weight 20 ppm by weight (for refrigerants used in low-pressure appliances [1])
Other Impurities Including Refrigerant	0.50% by weight
High boiling residue	0.01% by volume
Particulates/solids	visually clean to pass
Acidity	1.0 ppm by weight
Chlorides (chloride level for pass/fail is 3ppm)	No visible turbidity

[1]low-pressure appliances means an appliance that uses a refrigerant with a liquid phase saturation pressure below 45 psia at 104 °F.

Blend Compositions (where applicable)	
Nominal Composition (by weight%)	Allowable Composition (by weight%)
component constitutes 25% or more	± 2.0%
component constitutes less than 25% but greater than 10%	± 1.0%
component constitutes less than or equal to 10%	± 0.5%